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Experimenting with the Governance of Plants as Intellectual Property: Limitations, Possibilities, and the Ecuadorian Experience

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Abstract

This thesis explores the limitations and possibilities for the making of intellectual property laws for plants. The analysis is grounded in the contention that in recent years, a particular logic – understood here as a certain set of assumptions about the purpose of legal regimes – has come to dominate the way that lawmakers think about how to structure relationships between people, institutions, and plants. Thus, the dominant form of intellectual property for plants has materialised in systems that grant "plant breeders' rights." These regimes are predicated on a number of conventions, including that new plant varieties should be conceived as marketable technologies, that innovative activities undertaken by private actors to create plants with favourable traits should be incentivised, and that investment in breeding activity should be rewarded via exclusive commercial exploitation rights.

The plant breeders' rights model has influenced the way that different social actors think about how different uses of plants should be regulated, and about the meaning and purpose of intellectual property. Nevertheless, many options remain accessible for governments to design innovative legal frameworks for the regulation of relationships between people, institutions, and plants. This is true even where certain international legal instruments have to some extent limited the formal legal space available for domestic experimentation.

Using a case study format focused on recent lawmaking projects in Ecuador, this thesis recounts how rationalities alternative to the conventional plant breeders' rights model have manifested in new legislative and regulatory frameworks in that country. The methodology employed centres on doctrinal analysis of Ecuadorian and international legal regimes, and a socio-legal approach involving ethnographic fieldwork in Ecuador that occurred over the course of approximately seven months, in 2016 and 2018. The conclusion extrapolates several lessons from the Ecuadorian experience, which could be used to inform future initiatives for the making of novel intellectual property laws for plants in other countries.

Declaration by author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

I have clearly stated the contribution of others to my thesis as a whole, including statistical assistance, survey design, data analysis, significant technical procedures, professional editorial advice, financial support and any other original research work used or reported in my thesis. The content of my thesis is the result of work I have carried out since the commencement of my higher degree by research candidature and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution. I have clearly stated which parts of my thesis, if any, have been submitted to qualify for another award.

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Publications included in this thesis

Jefferson, D. J. (2017). Ingenuity and the Re-Imagining of Intellectual Property: An Introduction to the *Código Ingenios* of Ecuador. *European Intellectual Property Review 39*(1), 21.

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Research Involving Human or Animal Subjects

This research involved human subjects, and all relevant ethical approvals were received from the Human Ethics Unit at the University of Queensland. A copy of the ethics approval letter is provided in Appendix A of this thesis.

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Dedications

This thesis is dedicated to the women and men who grow our food, and who contribute to the health of our world's biodiversity.

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List of Abbreviations Used in the Thesis

1998 Intellectual Property Law: Ley de Propiedad Intelectual del Ecuador, Codificación No. 2006-013

2008 Constitution: Constitución de la República de Ecuador (2008)

2009 Food Sovereignty Law: Ley Orgánica del Régimen de la Soberanía Alimentaria del Ecuador (2009)

2017 Seed Law: Ley Orgánica de Agrobiodiversidad, Semillas y Fomento de la Agricultura Sustentable del Ecuador (2017)

CBD: Convention on Biological Diversity (1993)

Ingenios Act: Código Orgánico de la Economía Social de los Conocimientos, Creatividad e Innovación del Ecuador (2016)

Nagoya Protocol: The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (2014)

Plant Treaty: International Treaty on Plant Genetic Resources for Food and Agriculture (2004)

TRIPS: Agreement on Trade-Related Aspects of Intellectual Property (1995)

UPOV: Union for the Protection of New Varieties of Plants

UPOV 1978: International Convention for the Protection of New Varieties of Plants of December 2, 1961, as revised at Geneva on November 10, 1972, and on October 23, 1978

UPOV 1991: International Convention for the Protection of New Varieties of Plants of December 2, 1961, as revised at Geneva on November 10, 1972, on October 23, 1978, and on March 19, 1991

WIPO: World Intellectual Property Organization

WTO: World Trade Organization

Part 1. Plants and Intellectual Property: A Doctrinal History

Introduction

Over the past two decades or so, there has been a growing interest in intellectual property and its relationship to the creation and use of plants. Several factors help to explain this growing interest. Across the world, the fundamental nature of agriculture is changing, as evidenced by the advent of many new technologies, including widely accessible genetic methods for the creation of new varieties of plants. These shifts are occurring in the context of the need to produce food for a burgeoning human population while farming faces multifaceted challenges from climate change, development of land, and urbanisation. Simultaneously, historically marginalised groups of people including peasants and indigenous populations have gained both political visibility and new legal rights. These achievements have obviated the need to provide greater protections for customary forms of agriculture, even while industrialised techniques spread in many countries where smallholder farming is still common. Intellectual property for plants is implicated in all of these undercurrents in one way or another.

Debates between scholars, government officials, and members of civil society over how to best legislate the issue of intellectual property for plants tend to fall into two general categories. On one side are actors who express pessimistic views about the inclusion of plants as part of the subject matter protected as intellectual property, construing these laws as impediments to the broad accessibility of seeds and other planting material. The other camp is comprised of people who support intellectual property for plants based on particular legal rights or economic development theories. Both of these groups tend to conceive of conventional forms of intellectual property for plants as fixed categories, in which little space exists for innovation in lawmaking.

In contrast, the viewpoint that this thesis presents is not dichotomous. The thesis tells a story about lawmakers who have encountered the means to be creative in unexpected places. It recounts how, in areas of the law that are often assumed to be fixed and static, room can still be found for experimentation. This stands in distinction to the perspectives that have characterised many prior studies of intellectual property for plants, which generally have implied that new ideas are unlikely to surface when countries design and enact laws that grant intellectual property for plants.

The analysis that this thesis conducts is grounded in several key observations. First, the discussion recognises the fact that over the past two decades or so, numerous social actors have expressed the need to find local solutions when designing intellectual property laws that cover biological subject matter, especially plants. As the products of agricultural research have become increasingly privatised, commodified, and monetised, new varieties of plants are now conceived in proprietary terms. The ability to obtain exclusive exploitation rights over these "goods" has become progressively more important to the entities that create plants with improved traits, because many new varieties command significant market value. Meanwhile, plant breeding today is a highly specialised science, due in part to the fact that advanced techniques for molecular level trait selection, and genetic modification and engineering have opened up new possibilities for "innovation" to create varieties with favourable characteristics. The conceptualisation of plant breeding as technological in essence has enabled the application of the logic of invention to its creations, which historically were conceived as products of nature rather than of human ingenuity.

Meanwhile, discontent about these attributes of the nature of modern agriculture has arisen in many parts of the world. As multinational seed enterprises become increasingly consolidated and the genetic diversity of commonly cultivated crop varieties progressively narrows, civil society and government actors alike worry ever more about the economic, environmental, and social consequences of industrialised agriculture. Simultaneously, in many countries advocates for indigenous and traditional rural communities have achieved greater political and legal recognition. Many of these groups overtly oppose the extension of a rationality of proprietary rights to plants, especially crops that are cultivated for human consumption. Civil society actors who hold these views often express the belief that seeds should circulate without restrictions, free from encumbrances owned by private entities and individuals.

In this context, a second key observation drives the inquiry that the thesis undertakes. That is, in recent years legal instruments that set the terms for proprietary relationships surrounding the use of different kinds of plants have proliferated. On the one hand, many countries have adhered to international regimes that require the enactment of domestic legislation to recognise intellectual property protection for new

varieties[1] of plants. While representatives of territories in which industrialised agriculture is commonplace originally envisaged these frameworks, developing countries now also regularly adopt intellectual property laws for plants.

However, in many developing countries customary farming systems remain widespread. In these parts of the world, movements advocating for the rights of indigenous and local farming communities, the conservation of agrobiodiversity, and food sovereignty[2] have gained traction. As a result, new national and international laws have been enacted to grant protections for different types of plants outside of the realm of intellectual property. The convergence of these trends means that many countries are now obligated, based on a variety of international commitments, to implement multiple laws that differentially conceive of relationships between people, institutions, and plants.

The most prominent international instrument to set minimum standards for domestic intellectual property laws – including those that cover plants – is the Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS"). The TRIPS Agreement mandates that all World Trade Organization ("WTO") Member States must offer a system through which new plant varieties can be protected as intellectual property. However, the TRIPS Agreement also affords countries a measure of flexibility to experiment with locally tailored laws to regulate plants as intellectual property. For the purposes of this thesis, the exceptions, ambiguities, and lacunae in the TRIPS Agreement and other international agreements are referred to as "formal legal space." This term is employed to recognise the space to experiment with local solutions that has been officially inscribed in legal instruments, and which therefore should be construed as real rather than speculative.

The existence of a formal legal space for the making of intellectual property laws for plants is evident in Article 27.3(b) of the TRIPS Agreement, which stipulates

[1] According to the International Convention for the Protection of New Varieties of Plants (1991), a variety may be understood as "a plant grouping within a single botanical taxon of the lowest known rank, which…can be defined by the expression of the characteristics resulting from a given genotype or combination of genotypes; distinguished from any other plant grouping by the expression of at least one of the said characteristics and; considered as a unit with regard to its suitability for being propagated unchanged." Art. 1(vi).

[2] The concept of food sovereignty may be understood as "the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agricultural systems." Declaration of Nyéléni. (27 February 2007). Sélingué, Mali. *Retrieved from* https://nyeleni.org/spip.php?article290.

that these regimes may take the form of patents, an "effective *sui generis*[3] system," or any combination thereof. In practice, the official recognition in TRIPS of the validity of *sui generis* forms of intellectual property for plants means that WTO Member States are free to design norms that consider all of the factors relevant to the ways that agriculture is practiced within their borders. Countries including India, Thailand, Malaysia, and more recently, Ecuador, have taken advantage of this formal legal space to develop customised national intellectual property laws for plants.

The aim of this thesis is to explore this kind of legal experimentation – what it is, and how it has operated – in Ecuador. The Ecuadorian experience is invoked to illustrate the possibilities for lawmaking that continue to exist, and to serve as a model for how legislators, regulators, legal scholars, and members of civil society might begin to rethink conventional norms of intellectual property for plants. The thesis recounts how lawmakers in Ecuador responded to the need to find local solutions during the process of designing a new intellectual property law for plants from 2014 to 2016.

The Ecuadorian case study demonstrates that notwithstanding the availability of a formal legal space, which offers lawmakers some flexibility and choice in designing new laws to regulate plants as intellectual property, nonetheless a certain logic has come to dominate the way that lawmakers think about experimental legislation. The proliferation of a uniform, standardised way of thinking has had the effect of limiting the production of creative, local solutions, even in the absence of formal constraints. In both Ecuador and other countries throughout the world, legislators and other social actors have come to conceive of intellectual property for plants narrowly. The dominant paradigm has internalised the precepts of one particular model of intellectual property for plants, which is the system of "plant breeders' rights" embodied in the Convention of the International Union for the Protection of New Varieties of Plants ("UPOV Convention").

This limited conceptualisation prioritises and promotes a particular form of agriculture, and more broadly a bounded way of thinking about how different people and institutions relate to plants. Specifically, it is assumed that exclusive exploitation rights must be awarded to developers of new varieties of plants to provide an incentive

[3] From Latin, *sui generis* may be translated as "of its own kind." In the context of the making of intellectual property laws for plants and against the backdrop of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization, *sui generis* means an alternative to the provision of patent protection for new plant varieties.

to these actors to invest in breeding. According to this standard, plant varieties are understood as inventions, as technologies created through human ingenuity, and as marketable products destined for commercialisation. Even where countries are not members of the UPOV Convention, the logic of plant breeders' rights now dominates imaginaries for lawmaking, such that non-UPOV intellectual property laws are viewed as deviations from the mainstream.

However, this need not be the case. This thesis argues that although it is true that opportunities for experimentation with locally tailored intellectual property laws for plants are in some ways formally bounded by international legal obligations, new paradigms may still be developed. This means that space remains available for the inscription of alternative rationalities to regulate relationships between people, institutions, and plants. Innovative options can be located in domains beyond intellectual property legislation, including administrative regulations to implement plant breeders' rights laws; seed laws; systems of protection for traditional knowledge; and regimes governing access to genetic resources and equitable benefit sharing. As the case study of Ecuador demonstrates, it is now necessary to transcend the model of plant breeders' rights to imagine new futures that would consider the needs of the multiplicity of actors who participate in national agricultural sectors.

Thesis Overview and Structure

This thesis argues that a proprietary logic has come to dominate the legal imaginaries that structure relationships between people, institutions, and plants. This is especially the case for new plant varieties, which are conventionally understood as discrete and homogenous goods designed to circulate broadly in world markets. Concomitant with the narrowing of the way in which the practice of plant breeding and development is conceived is the recent proliferation of legal regimes that regulate plants as a form of intellectual property. As discussed above, the TRIPS Agreement provides a threshold standard, as the first international legal instrument that formally required signatories to enact systems for the regulation of plants as intellectual property. Although the terms of the TRIPS Agreement unequivocally state that plant varieties must be protected as intellectual property, the Agreement affords parties substantial latitude to develop local *sui generis* legislation.

However, subsequent to the entry into force of the TRIPS Agreement, the situation has become more complicated. Today, numerous bilateral and multilateral free trade agreements not only reinscribe the TRIPS Article 27.3(b) requirement, but also increase the minimum standards to which countries must adhere to regulate plants according to the rationality of intellectual property.[4] Meanwhile, additional international regimes whose terms govern the ability to access and use certain types of plants have also entered into force over the last two decades or so. Prominent examples include the Convention on Biological Diversity (1993) and its Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization ("Nagoya Protocol," 2014). Another relevant framework is the International Treaty on Plant Genetic Resources for Food and Agriculture ("Plant Treaty," 2004), which is administered by the Food and Agriculture Organization of the United Nations.

In the context of this complex international legal landscape, it is unsurprising that prior analyses have focused on exploring the formal policy space or "flexibilities" that remain available in international treaties for the making of intellectual property laws that govern the uses of plants. Throughout approximately the past two decades, numerous analyses have been conducted to understand how TRIPS and other international agreements might affect the form that national legislation may take. One of the areas of particular interest has centred on the ways that treaties affect the ability of countries to create laws that grant a form of "plant variety protection"[5] that would be appropriately tailored to the realities of local agricultural sectors. The findings of such research typically support conclusions that multilateral treaties such as the TRIPS Agreement – frequently coupled with subsequent, bilateral trade agreements that increase the TRIPS minimum standards – now saturate the intellectual property policy space in many world regions. It has been commonly argued that this situation limits

[4] *See, e.g.,* Drahos, P. (2001) BITs and BIPs. *The Journal of World Intellectual Property 4*(6), 791-808.

[5] Note that the terms "plant variety protection," "plant variety rights," and "plant breeders' rights" are often used interchangeably. In the present thesis, the term "plant variety protection" is used broadly to represent all types of systems designed to grant intellectual property for plants. In contrast, the term "plant breeders' rights" is used to designate regimes that are based on the model established by the UPOV Convention.

the potential of individual countries to design innovative and locally situated approaches to govern the uses of different types of plants.[6]

In addition to the various academic studies of how plants are conceptualised as intellectual property, policymakers and civil society activists have regularly conducted their own analyses to argue against the imposition of international minimum standards on domestic legislative imaginaries. Such works generally contend that external regimes that mandate minimum standards are detrimental to national interests. This may be the case especially in developing countries, where certain local priorities are viewed as irreconcilable with the logic of intellectual property. Therefore, some governments have developed alternative legal instruments to counterbalance plant breeders' rights laws, including policies designed to safeguard customary agricultural practices, to conserve national agrobiodiversity, and in some cases, to foment food sovereignty.[7]

Notwithstanding the pessimism with which some scholars and civil society actors view the contemporary situation, a few prominent experts claim to have identified "unused policy space"[8] that remains latent yet available for customising intellectual property laws within the context of a multitude of treaty obligations. The quest for this hidden policy space, these lacunae in which lawmakers might innovate, has inspired cautiously optimistic analyses. The central question that unites such endeavours is how can parties to international agreements mitigate the potential adverse effects of minimum intellectual property standards through a variety of strategic actions? Areas of possible experimentation may include scrupulous study of the vacuums remaining in treaty texts, creative interpretation of vague language, and exploitation of alternative legislative or administrative options to accomplish national policy goals.

This thesis builds on prior analyses of formal policy space for the regulation of plants as intellectual property, to create a broader understanding of the limitations and

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[6] *See, e.g.,* de Beer, J., Baarbé, J., & Ncube, C. B. (5 May 2017). The Intellectual Property Treaty Landscape in Africa, 1885 to 2015. openAIR African Innovation Research, Working Paper No. 4.

[7] *See, e.g.,* The Crucible Group. (1994) *People, Plants, and Patents: The Impact of Intellectual Property on Trade, Plant Biodiversity, and Rural Society*. Ottawa: International Development Research Centre.

[8] *See* Correa, C.M., with contributions from Shashikant, S. and Meienberg, F. (2015) Plant Variety Protection in Developing Countries. A Tool for Designing a Sui Generis Plant Variety Protection System: An Alternative to UPOV 1991. Working paper published by the Association for Plant Breeding for the Benefit of Society (APBREBES) and its member organisations: Berne Declaration, The Development Fund, SEARICE and Third World Network.

possibilities for lawmaking at the national level. The case study format of the thesis, which is grounded in recent experiences of policy formation in Ecuador, provides a basis for understanding how these dynamics have played out in reality. In addition to describing how Ecuadorian lawmakers felt constrained in their ability to innovate, the thesis also identifies examples of playfulness, where government officials successfully embedded domestic policy goals in creative legislation.

In so doing, the thesis explores dynamics that were both external and internal to the national political realm in Ecuador. Relevant external factors included the exceptions, ambiguities, and lacunae that exist in the TRIPS Agreement and other international legal instruments, which Ecuadorian lawmakers considered and that other countries could exploit to construct imaginative domestic legislation. Furthermore, in contrast to many prior studies, the thesis demonstrates that at least in the Ecuadorian case, numerous factors other than international obligations affected the way that lawmakers conceived of intellectual property for plants.

Implicit to previous work in this area is the assumption that if a country is not required to give effect to the terms of a particular treaty, then it will not do so. For example, if a country is not a member of the TRIPS Agreement or the UPOV Convention, then it is presumed that the country will not recognise intellectual property for plants in the form of plant breeders' rights. However, this hypothesis does not consider that numerous pressures beyond treaty obligations may operate to erect parameters that circumscribe the possibilities for lawmaking in a given territory. Internal dynamics, while generally not mentioned in studies of formal policy space, are frequently at least as important to consider as the scope of international agreements. Relevant internal forces that may shape the way in which a particular country regulates plants as intellectual property include the relative influence of various actors in the national agricultural sector, as well as the particular social and political paradigms under which the country operates.

While external and internal influences may have different sources, it is notable that both have been shaped by a particular set of assumptions. According to the conventional logic, new plant varieties should be conceived as technologies produced by human ingenuity, the creation of which should be rewarded through the grant of exclusive (proprietary) exploitation rights. This exclusivity then affords right holders a temporary market monopoly, which allows for the recuperation of the investment

expended during the development of the new variety. In other words, the plant breeders' rights model for conceptualising plants as intellectual property has become the global standard. The rationality of this paradigm has co-developed with a form of agriculture that is increasingly industrialised and market oriented in many parts of the world. Commensurately, other ways of thinking about agricultural plants and systems are conceived as antiquated, impoverished, or as deviations from this norm.

Rather than reify this dynamic, the thesis argues that notwithstanding the formal legal obligations that national governments have assumed both in Ecuador and elsewhere, lawmakers remain free to generate alternative imaginaries to structure relationships between people, institutions, and different types of plants. Thus, countries could pursue different sets of policy options, depending on the formal legal space that is available to them and the nature of their domestic agricultural sectors. The recommendations that the thesis develops are based on the categorisation of countries into two general groupings.

The first of these includes territories that are "legally unbound." Such countries enjoy broad formal legal space in which to create innovative domestic legislation, either because they are not Member States of the World Trade Organization, or because they are WTO signatories that are classified as "least developed countries." Importantly, this latter group of nations has been granted a transition period during which they are not required to implement systems of intellectual property protection as required by the TRIPS Agreement until 1 July 2021.[9] It is also notable that legally unbound countries are not members of the UPOV Convention.

The second category of countries includes "legally bound" territories. These States are subject to different types of formal legal obligations, some of which are more restrictive than others. For instance, countries that are only obligated to adhere to the TRIPS Agreement enjoy relatively broader formal legal space than those which have undertaken commitments under additional treaty regimes. The sources of these obligations may include bilateral trade agreements or multilateral treaties such as the UPOV Convention, the Convention on Biological Diversity and its Nagoya Protocol, and the Plant Treaty.

[9] World Trade Organization. (16 October 2013). Responding to least developed countries' special needs in intellectual property. *Retrieved from* https://www.wto.org/english/tratop_e/trips_e/ldc_e.htm.

Pursuant to this broad categorisation, Chapter 1 of the thesis characterises the formal legal space as it existed in 2018, by elaborating a typology of countries to illustrate how national governments may differentially approach the regulation of relationships between people, institutions, and different types of plants, including according to the logic of intellectual property. Chapter 1 explores various international instruments that relate to this subject matter, including the TRIPS Agreement, the 1978 and 1991 versions of the UPOV Convention, the Nagoya Protocol, and the Plant Treaty. Furthermore, Chapter 1 unpacks the multiplicity of regional and bilateral trade agreements that mandate how intellectual property laws for plants should structure the rights and interests of various actors.

Chapter 1 also surveys factors beyond treaty obligations that may influence how countries choose to regulate the ability of actors to access and use different types of plants. These factors could include internal dynamics such as the nature of the domestic agricultural sector in a given territory, national paradigms and strategies for development, local social, cultural, and political dynamics, and the characteristics of the country's research and development infrastructure for plant breeding, among others. Finally, Chapter 1 briefly introduces the case study in which the analysis of the thesis is grounded. The country of focus is Ecuador, a territory that is legally bound to several international agreements but has recently experimented with re-imagining its national system of intellectual property for plants.

Chapter 2 builds upon the typology of countries developed in the first chapter, by exploring two primary "conventional" approaches to the regulation of plants as intellectual property. These alternatives track the language of the TRIPS Agreement, aligning with the general categories of patents and *sui generis* laws that grant intellectual property protection for plants. The analysis elaborated in Chapter 2 is grounded in one overarching question: based on its external obligations, can a given country choose *not* to use a particular system or a part thereof to regulate plants as intellectual property? If the answer to this query is yes, then the country in question can employ a variety of legislative strategies to grant intellectual property for plants. In order to understand the nature of these laws and the way that they might be customised to fit the situation of a given society, Chapter 2 investigates patents and *sui generis* forms of intellectual property for plants in detail.

Finally, Chapter 2 presents two broad, generalizable options for how countries could regulate plants as intellectual property, while simultaneously addressing other important policy goals related to the access and use of diverse types of plants by different social actors. Essentially, governments could consider either (1) adopting a unified law to address all relevant issues; or (2) enacting parallel laws, thereby separating intellectual property standards from all other objectives. Both of these options could be informed by several extant, "less conventional" legislative solutions to the regulation of plants according to alternative logics, such as seed laws, systems for the protection of traditional knowledge related to plant genetic resources, and regimes designed to advance food security or food sovereignty. Furthermore, countries could explore the option of retooling conventional legal frameworks at the administrative, rather than the legislative level. Such an approach would involve designing regulatory regimes that simultaneously fulfil international obligations and respond to internal dynamics.

Subsequent to laying the foundation for analysis in Part 1, the second part of the thesis develops the case study of Ecuador, as a means to explore both the limitations and possibilities of lawmaking. Ecuador is a small, yet culturally and geographically diverse developing country located in the Andean region of South America. The country is a member of the World Trade Organization and it is therefore legally bound to the TRIPS Agreement. Ecuador has also taken on several other international commitments related to regulating the relationships between people, institutions, and plants. Through the Ecuadorian case study, the thesis recounts the story of a nation that has recently attempted to re-imagine the meaning and purpose of intellectual property within its borders, in part through a conscious attempt to exploit the exceptions, ambiguities, and lacunae in international agreements. The form that the new Ecuadorian intellectual property law for plants has taken also reflects the relevance of certain internal dynamics that shaped the legislative process.

Chapter 3 of the thesis unpacks the making of the new Ecuadorian intellectual property law for plants, an analysis that considers various contextual factors that inspired the legislative reform and the aspirations with which the new regime is imbued. Subsequently, Chapter 4 examines the extent to which the new Ecuadorian system for the regulation of plants as intellectual property is novel and experimental, versus the extent to which it tends to conform to the conventional logic. This chapter

also explores how Ecuador has embedded issues related to the governance of relationships between people, institutions, and plants in other recently enacted legal regimes, including the national seed law and the framework of protections for traditional knowledge.

Chapter 5 extrapolates several lessons from the Ecuadorian case study that could inform future lawmaking projects in other countries. For instance, rather than adopt one of the standardised options described in Chapter 2 of the thesis, Ecuador has elected a third approach. The Ecuadorian strategy involves regulating relationships between people, institutions, and plants through multiple legal frameworks. Together, these regimes endeavour to respond simultaneously to the needs of actors in the domestic agricultural sector and uphold the country's international obligations.

Following the analysis of the Ecuadorian case study, Part 3 offers a series of conclusions. Foremost, it is argued that by narrowly focusing on how to design systems to grant plant breeders' rights – whether based on a perceived need to comply with international treaty obligations, a desire to serve certain local interests, or other reasons – lawmakers may obscure or neglect other important policy goals. As a result, alternative ways of thinking about how people, institutions, and plants interrelate may be marginalised. However, notwithstanding the extent to which the logic of plant breeders' rights has come to dominate imaginaries for the creation of intellectual property laws for plants, opportunities for experimentation remain available. The discussion that follows is dedicated to illuminating some of these options, towards the end of rendering alternative rationalities more readily available.

Chapter 1. Defining the Formal Legal Space: A Typology of Countries

As the introductory section of this thesis has argued, throughout the world a proprietary logic has shaped imaginaries for the making of laws to regulate plants as intellectual property. One important explanation for this is found in the recent proliferation of international legal instruments that require many territories to develop intellectual property laws for plants. Depending on the obligations to which a particular country is subject, it may be located in a typology of two general categories. These are (1) legally unbound countries, which are territories that can regulate plants as intellectual property in any way that they wish. Importantly, as long as they are legally unbound, these countries may also choose *not* to include plants as the subject matter of intellectual property.

The second broad category includes (2) legally bound countries. Such territories are subject to one or more international obligations that require the granting of proprietary rights to individuals or entities that develop new varieties of plants. Legally bound countries may be further categorised according to the international obligations that they have individually assumed. The typology of countries and the obligations to which they are subject in relation to the regulation of plants as intellectual property are elaborated in Table 1 and Figures 1-3.

Table 1: Typology of Countries with Obligations to Protect Plants as Intellectual Property

Category of Country	Subcategory of Country	Obligation(s)	Source of Obligations
Legally Unbound	Non-WTO & Non-UPOV	None.	None.
	WTO observer & Non-UPOV	None (at present).	None (at present).
	WTO member classified as "least developed" & Non-UPOV	By 1 July 2021, protect new plant varieties through (a) patents or (b) a *sui generis* system.	TRIPS Agreement Art. 27.3(b).
Legally Bound	WTO member not classified as "least developed"	Protect new plant varieties through (a) patents or (b) a *sui generis* system.	TRIPS Agreement Art. 27.3(b).

Category of Country	Subcategory of Country	Obligation(s)	Source of Obligations
	Member of WTO and UPOV 1978	Protect new plant varieties with system of breeders' rights outlined in UPOV 1978, but not with patents.	TRIPS Agreement Art. 27.3(b). UPOV Convention (1978). Possibly other trade agreements.
	Member of WTO and UPOV 1991	Protect new plant varieties with system of breeders' rights outlined in UPOV 1991, and possibly also with patents.	TRIPS Agreement Art. 27.3(b). UPOV Convention (1991). Possibly other trade agreements.
	Member of WTO and/or UPOV with additional treaty obligations	Depending on specific obligations, may include protecting plant varieties as IP; creating a system for access to plant genetic resources; and providing a system for benefit sharing.	Possibly TRIPS and the UPOV Convention, plus the CBD, and/or Nagoya Protocol, and/or the ITPGRFA.

Figure 1: Legally Unbound Countries

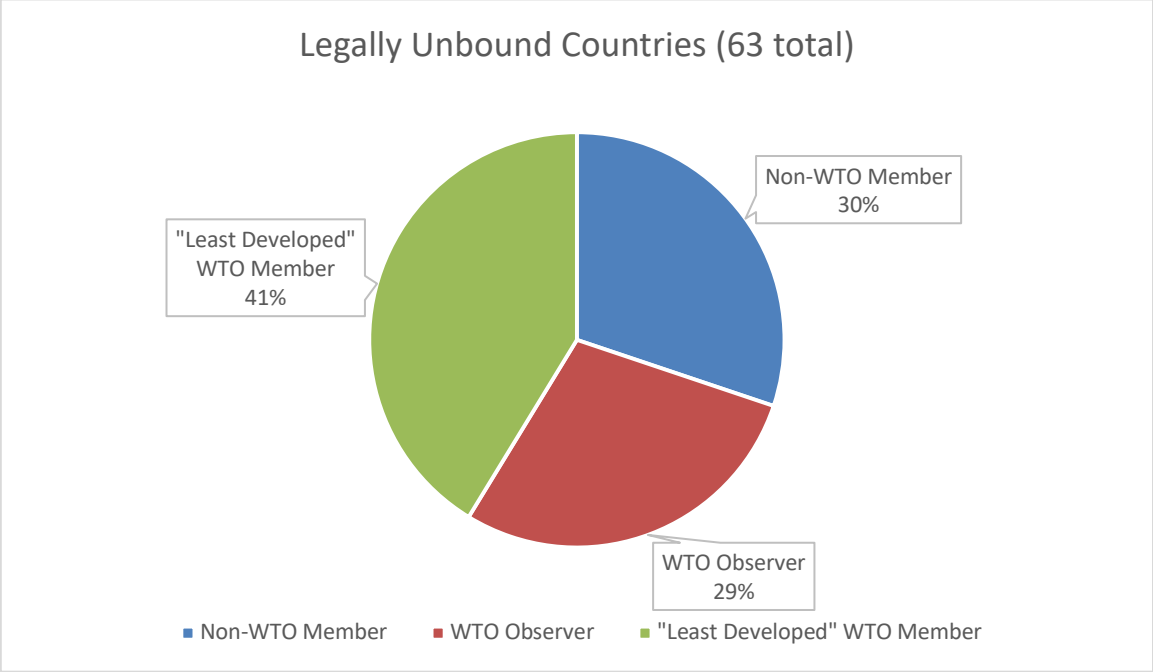


Figure 2: Legally Bound Countries

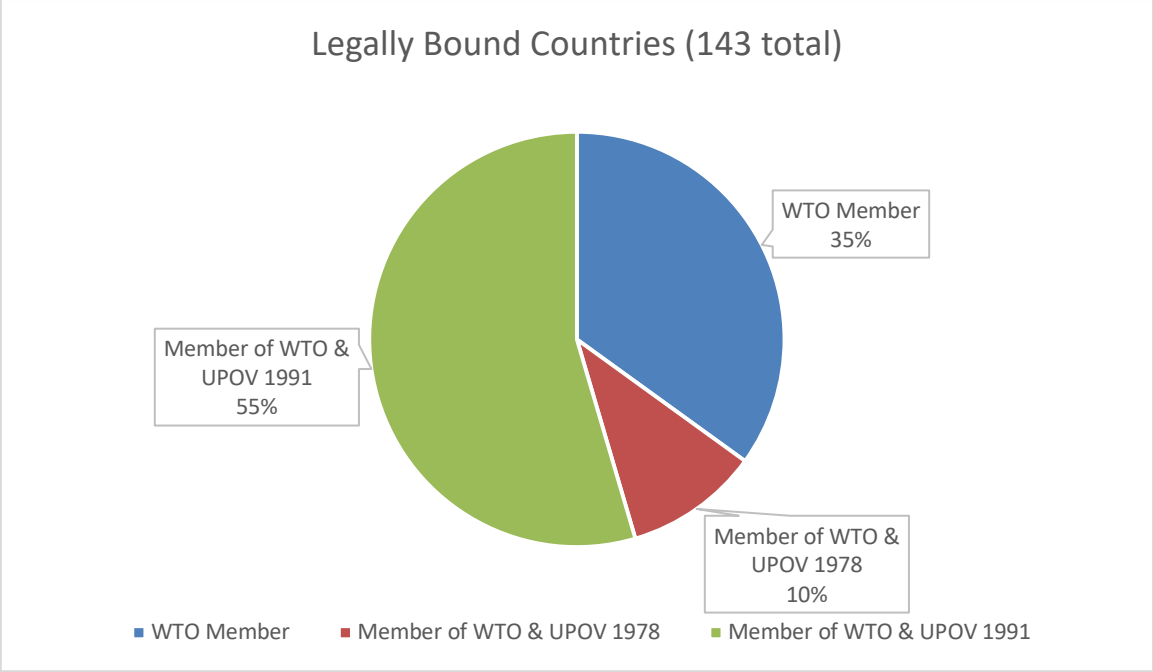
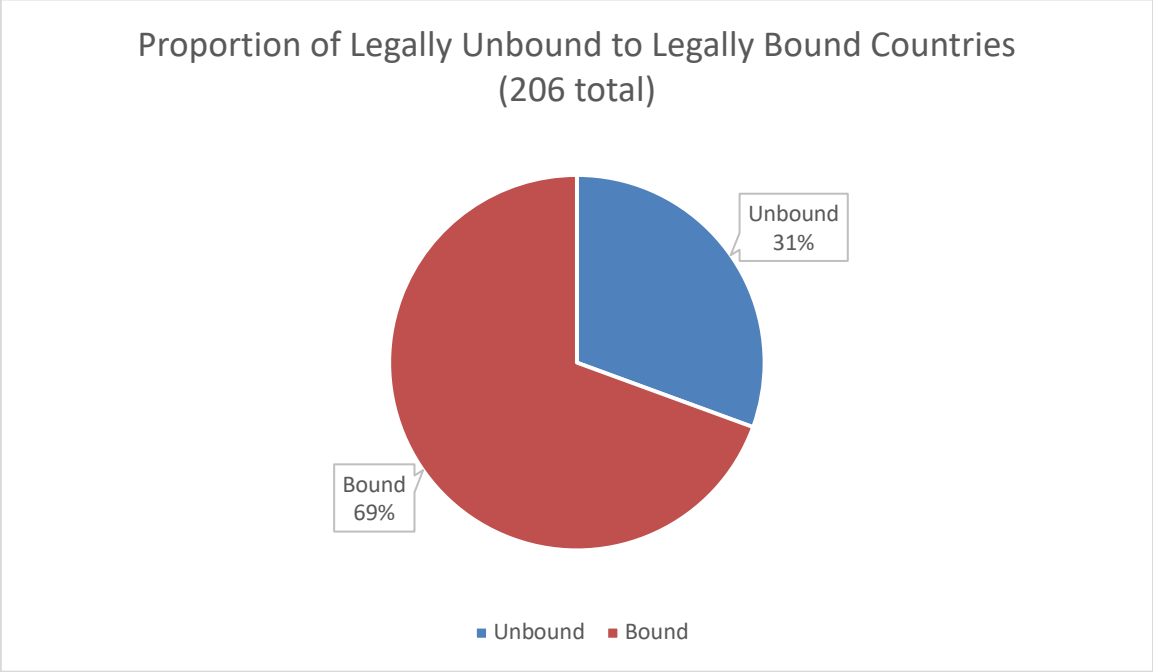


Figure 3: Overall Characterisation of Countries



In 2018, there were sixty-three legally unbound countries in the world. This grouping included nineteen non-members of the World Trade Organization, eighteen WTO observers, and twenty-six current WTO members that were classified as least developed countries. The first set of legally unbound countries, that is, those that were not members or observers of the World Trade Organization, enjoyed the broadest latitude in relation to the regulation of plants as intellectual property. These territories were under no present or future legal obligation to provide a form of intellectual property for plants.

In contrast, while the second and third set of legally unbound countries were not subject to any current requirement to regulate plants as intellectual property, they will ostensibly be subject to the terms of the TRIPS Agreement in the future. For World Trade Organization observers, the Article 27.3(b) obligation will be triggered when these countries accede to the Organization. Meanwhile, WTO members that as of 2018 were classified as least developed countries are obliged to become TRIPS compliant by 1 July 2021. A list of the legally unbound countries in each subcategory is provided in Table 2.

Table 2: Categories of Legally Unbound Countries (63 Total)

Non-WTO Countries	WTO Observers	WTO Members Classified as "Least Developed"
1. Andorra 2. Bahamas 3. Comoros 4. Curacao 5. Eritrea 6. Holy See (Vatican City) 7. Kiribati 8. Kosovo 9. Marshall Islands 10. Micronesia 11. Monaco 12. Nauru 13. North Korea 14. Palau 15. Palestinian Territories 16. San Marino 17. Sint Maarten 18. Turkmenistan 19. Tuvalu	1. Algeria 2. Azerbaijan 3. Belarus 4. Bhutan 5. Bosnia and Herzegovina 6. Ethiopia 7. Equatorial Guinea 8. Iran 9. Iraq 10. Lebanese Republic 11. Libya 12. Serbia 13. Somalia 14. South Sudan 15. Sudan 16. Syrian Arab Republic 17. Timor-Leste 18. Uzbekistan	1. Afghanistan 2. Angola 3. Bangladesh 4. Benin 5. Burkina Faso 6. Burundi 7. Cambodia 8. Central African Republic 9. Chad 10. Democratic Republic of the Congo 11. Djibouti 12. Guinea 13. Guinea Bissau 14. Haiti 15. Lao People's Democratic Republic 16. Madagascar 17. Mali 18. Mauritania 19. Myanmar 20. Nepal 21. Niger 22. Senegal 23. Solomon Islands 24. Togo 25. Vanuatu 26. Yemen

At sixty-three, the number of legally unbound countries is significant. However, as of 2018, a far larger quantity of legally bound countries existed. Specifically, there were fifty territories that, (1) were full members of the World Trade Organization, (2) were not classified as "least developed countries," and (3) were bound to the terms of the TRIPS Agreement but not to additional multilateral international obligations.

Meanwhile, fifteen[10] countries were obligated to adhere to both the TRIPS Agreement and the 1978 version of the UPOV Convention. A further fifty-seven territories had signed the 1991 version of the UPOV Convention. However, this number is somewhat misleading, given that two of the UPOV 1991 signatories were intergovernmental organisations, namely the European Union (EU) and the African Intellectual Property Organization (ARIPO). These groups are comprised of twenty-eight[11] and nineteen Member States, respectively, meaning that as of 2018 the true number of countries that were bound to the terms of UPOV 1991 was seventy-eight. Lists of the territories classified as legally bound are provided in Tables 3-5.

Table 3: Countries Bound Only to TRIPS (50 total)

WTO Only Countries		
1. Antigua and Barbuda	17. Gabon	35. Papua New Guinea
2. Armenia	18. Grenada	36. Philippines
3. Bahrain	19. Guatemala	37. Qatar
4. Barbados	20. Guyana	38. Saint Kitts and Nevis
5. Belize	21. Honduras	39. Saint Lucia
6. Brunei Darussalam	22. India	40. Saint Vincent and the Grenadines
7. Cabo Verde	23. Indonesia	41. Samoa
8. Cameroon	24. Jamaica	42. Saudi Arabia
9. Congo	25. Kazakhstan	43. Seychelles
10. Côte d'Ivoire	26. Kuwait	44. Sri Lanka
11. Cuba	27. Liechtenstein	45. Suriname
12. Dominica	28. Malaysia	46. Tajikistan
13. Egypt	29. Maldives	47. Thailand
14. El Salvador	30. Mauritius	48. Tonga
15. Eswatini (Swaziland)	31. Republic of Moldova	49. United Arab Emirates
16. Fiji	32. Mongolia	50. Venezuela
	33. Nigeria	
	34. Pakistan	

[10] Although Italy and Portugal are also formally members of UPOV 1978, because these countries are also part of the European Union, they are *ipso facto* bound to the terms of UPOV 1991.
[11] Note that following the 2016 "Brexit" vote, the United Kingdom in the future will cease to be a member of the European Union. However, at that time the United Kingdom will still have obligations under UPOV 1991, as the country independently joined the Convention on 3 January 1999. UPOV. (2016). Members of the International Union for the Protection of New Varieties of Plants. Status on October 13, 2017. UPOV Publication No. 423. *Retrieved from* http://www.upov.int/export/sites/upov/members/en/pdf/pub423.pdf.

Table 4: Countries Bound to UPOV 1978 (15 total)

UPOV 1978 Countries	
1. Argentina 2. Bolivia 3. Brazil 4. Chile 5. China 6. Colombia 7. Ecuador 8. Mexico	9. New Zealand 10. Nicaragua 11. Norway 12. Paraguay 13. South Africa 14. Trinidad and Tobago 15. Uruguay

Table 5: Countries Bound to UPOV 1991 (78 total)

UPOV 1991 Countries		
1. Albania 2. Australia 3. Austria 4. Azerbaijan 5. Belarus 6. Belgium 7. Bosnia and Herzegovina 8. Botswana 9. Bulgaria 10. Canada 11. Costa Rica 12. Croatia 13. Cyprus 14. Czech Republic 15. Denmark 16. Dominican Republic 17. Estonia 18. Finland 19. France 20. The Gambia 21. Georgia 22. Germany 23. Ghana 24. Greece 25. Hungary 26. Iceland	27. Ireland 28. Israel 29. Italy 30. Japan 31. Jordan 32. Kenya 33. Kyrgyzstan 34. Latvia 35. Lesotho 36. Liberia 37. Lithuania 38. Luxembourg 39. Malawi 40. Malta 41. Montenegro 42. Morocco 43. Mozambique 44. Namibia 45. Netherlands 46. Oman 47. Panama 48. Peru 49. Poland 50. Portugal 51. Republic of Korea 52. Republic of Moldova 53. Romania 54. Russian Federation	55. Rwanda 56. São Tomé and Príncipe 57. Serbia 58. Sierra Leone 59. Singapore 60. Slovakia 61. Slovenia 62. Somalia 63. Spain 64. Sudan 65. Swaziland 66. Sweden 67. Switzerland 68. The former Yugoslav Republic of Macedonia 69. Tunisia 70. Turkey 71. Uganda 72. Ukraine 73. United Kingdom 74. United Republic of Tanzania 75. United States of America 76. Viet Nam 77. Zambia 78. Zimbabwe

Before delving more deeply into the differences between the various international obligations to which countries may be subject, it will first be helpful to explore the history of how agricultural plants came to be conceptualised as the subject matter of intellectual property in the first place. Treaty regimes such as the TRIPS Agreement or the UPOV Convention may appear to be monolithic entities, and their signing to be indicative of watershed moments in the development of international jurisprudence. However, a more accurate interpretation would understand these treaties as discrete embodiments of a complex, historical interplay of a variety of economic, scientific, and social forces that continue to evolve notwithstanding their apparent closure. The following section will briefly tell the story of how legal mechanisms designed to grant intellectual property for plants have developed and globalised.

1.1. Embodying Plants as Intellectual Property

The idea that plants should be the subject of proprietary rights began to develop in the late nineteenth and early twentieth centuries. During the period of increased systematised breeding for improved agricultural and horticultural crops following industrialisation in North America and Europe, proposals began to be circulated that endorsed the idea of allowing individuals and organisations that develop new varieties of different plant species to exclusively exploit their commercialisation. For instance, in 1907 private plant breeders in Britain debated the idea of using copyright to protect new varieties as a means to encourage breeders to share the details of their experiments and the resulting knowledge with the public.[12] Similarly, around the turn of the twentieth century, nurserymen and orchardists in the United States of America used innovative pricing strategies and trademarks in attempts to gain exclusive control over the sale of new trees and ornamental plants that they developed.[13]

Meanwhile, plant breeding became increasingly conceptualised as a science in the years following the rediscovery, in 1900, of Gregor Mendel's work on the principles

[12] Charnley, B. (2013). Why Didn't an Equivalent to the US Plant Patent Act of 1930 Emerge in Britain? Historicizing the Boundaries of Un-Patentable Innovation. In C. Lawson & J. Sanderson (Eds.), *The Intellectual Property and Food Project: From Rewarding Innovation and Creating to Feeding the World* (103-122). Farnham, UK: Ashgate Publishing Ltd.
[13] Kevles, D. J. (2007) Patents, Protections, and Privileges: The Establishment of Intellectual Property in Animals and Plants. *Isis, 98*, 323-331.

of inheritance and the potential application of this theory to the genetic improvement of organisms.[14] These laws of heredity provided a theoretical basis for the deliberate and calculated selection of desirable traits to obtain enhanced varieties of domesticated plants. The application of Mendelian genetics to scientific breeding represented one of several factors that culminated in the creation of the first formal intellectual property framework for plants, the 1930 United States Plant Patent Act.[15]

Other dynamics that contributed to the making of the 1930 Plant Patent Act included the proliferation of efforts to develop and market specific crop varieties in the United States, as well as the influence of powerful actors – including the commercial developers of new plant varieties – on the legislative process.[16] Generally, it has been argued that three broad sets of causes converged in the creation of the United States Plant Patent Act. These comprise geographic (e.g., the rapid territorial expansion of American plant breeding), scientific (e.g., advances based on Mendelism and pure line theory), and social (e.g., influence of actors such as nursery owners) currents, which together resulted in the conceptualisation of that had been improved through human agency in proprietary terms.[17]

Although plants became protectable under the United States Plant Patent Act, applying the concept of invention to the reality of biological organisms was a fraught process. The essential problem with granting patents claiming plants as the subject matter of protection is that even if understood as inventions, plants "compress diverse economic, cultural, and legal contexts."[18] Thus, extending an individualistic conception of "inventorship" to plants can operate to obfuscate the various entanglements between different human and environmental influences that historically contribute to the genetic improvement of a given species.

In order to transform the concept of invention to conform to the realities of plant reproductive biology, the 1930 Plant Patent Act had to reconstitute the essential elements of the modern patent bargain.[19] Thus, to comply with the modern

[14] Spiertz, H. (2014). Agricultural Sciences in Transition from 1800 to 2020: Exploring Knowledge and Creating Impact. *European Journal of Agronomy, 59*, 96-106.
[15] Townsend-Parnell Plant Patent Act of 23 May 1930, Pub. L. No. 245 (71st Congress).
[16] Fowler, C. (2000). The Plant Patent Act of 1930: A Sociological History of its Creation. *Journal of the Patent and Trademark Office Society, 82*, 621-644.
[17] Charnley, *supra* note 12.
[18] Pottage, A. & Sherman, B. (2007). Organisms and Manufactures: On the History of Plant Inventions. *Melbourne University Law Review, 31*, 539-568: 541.
[19] The notion of the patent bargain holds that the basic purpose of patent law is not simply to protect the proprietary rights of an owner, but to "provide access to informational resources that are

patentability criteria of origination, description, and reproduction, plant inventions had to be transubstantiated into a textual form, whose description would enable the facile manufacture of the protected specimen.[20] This rendering was enabled by the provision of protection in the Plant Patent Act solely for asexually reproducing plants, a fact that also constitutes the Act's most significant limitation.

Perhaps as the result of both the conceptual tensions and concrete incompleteness of the 1930 Plant Patent Act, the United States today remains the only country in the world to provide a specialised plant patent framework. However, notwithstanding the difficulty of imagining mechanisms through which to govern improved plant varieties according to a proprietary logic, efforts to create plant intellectual property regimes did not dissipate following the enactment of the Plant Patent Act. To the contrary, the application of the rationality of intellectual property to plants continued to expand through an "ongoing dialectic of resistance and accommodation" involving numerous influences, institutions, and actors.[21] In Europe, national level initiatives in the 1950s to enlarge patent laws so that they would cover plant varieties failed, but the underlying reasoning and interests continued to circulate and wield influence.[22] Thus, in 1957 the first session of the Diplomatic Conference on the Protection of Plant Varieties was organised.

After several years of negotiations at this Diplomatic Conference, an International Convention for the Protection of New Varieties of Plants (UPOV, for its initials in French) was adopted in 1961.[23] This multilateral agreement established common principles and a generalised framework for the subsequent enactment of national or regional plant variety rights regimes. The 1961 UPOV Convention outlined a form of intellectual property that could be applied to all botanical genera and

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necessary to create an informed set of publics." Murray, K. (2013). *A Politics of Patent Law: Crafting the Participatory Patent Bargain*. New York: Routledge. pp. 1.

[20] *Id*. at 567.

[21] Sanderson, J. (2017). *Plants, People and Practices: The Nature and History of the UPOV Convention*. Cambridge, UK: Cambridge University Press. pp. 44.

[22] *Id*.

[23] Act of 1961/1972. International Convention for the Protection of New Varieties of Plants. 1 December 1961. Note that UPOV 1961 was revised in 1972, though the sole substantive change to the Convention was the introduction of a five-class contribution system, through which the financial burden of the Union was to be divided among member States. Jördens, R. (2005) Progress of Plant Variety Protection Based on the International Convention for the Protection of New Varieties of Plants (UPOV Convention). *World Patent Information, 27*, 232-243.

species,[24] but that would simultaneously prohibit the protection of already patented varieties with plant breeders' rights.[25]

The initial members of UPOV were a group of thirteen European States, together with the European Economic Community, the United International Bureaux for the Protection of Industrial, Literary and Artistic Property – which later became the World Intellectual Property Organization – the Food and Agriculture Organization of the United Nations, and the Organization for Economic Co-operation and Development.[26] The UPOV Convention has been subsequently revised three times, superficially in 1972, and substantively in 1978 ("UPOV 1978") and 1991 ("UPOV 1991"). In recent years, the number of signatories to the Convention has expanded substantially, and as of 2018, UPOV had 75 members.[27]

Given the difficulties of conceptualising plants as inventions, one of the most significant challenges faced during the making of the 1961 UPOV Convention was the delimitation of the subject matter eligible for protection. Ultimately, the Convention was structured around the notion of the plant variety, which itself needed to be conceptually defined for the purposes of the treaty. The fields of taxonomy and nomenclature provided an initial basis upon which the meaning of the plant variety was fixed, such that in UPOV 1961 the term referred to tangible objects in nature, produced by plant breeders.[28] In other words, the subject matter over which rights were granted under UPOV 1961 focused on the end product of plant breeding, that is, improved varieties that were able to meet certain minimum criteria in order to be protectable.

The requirements for plant breeders' rights originally outlined in UPOV 1961 mandated that a variety must be new in a commercial sense,[29] as well as distinct,

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[24] UPOV 1961/1972. Art. 4(1).
[25] UPOV 1961/1972. Art. 2(1).
[26] The thirteen European States to become the original members of UPOV 1961 were Austria, Belgium, Denmark, Finland, Federal Republic of Germany, France, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom. Several non-governmental organisations also were among the founding members of UPOV, including the International Association of Plant Breeders for the Protection of Plant Varieties (ASSINSEL), the International Association for the Protection of Industrial Property (AIPPI), and the International Federation of Seed Trade (FIS). Jördens, *supra* note 23.
[27] These include 72 independent States and two intergovernmental organisations: the European Union and the African Intellectual Property Organization. UPOV (2016) Members of the International Union for the Protection of New Varieties of Plants. Status on October 13, 2017. UPOV Publication No. 423. *Retrieved from* http://www.upov.int/export/sites/upov/members/en/pdf/pub423.pdf.
[28] Sanderson, *supra* note 21 at 116.
[29] For the purposes of UPOV, novelty means that at the time of application for protection in a member State, the new variety must not have been offered for sale or marketed for a set number of years. UPOV 1961 Art. 6(1)(b); UPOV 1978 Art. 6(1)(b); UPOV 1991 Art. 6.

homogeneous – later changed to uniform in UPOV 1991 – and stable in order to be protected (commonly abbreviated as the "DUS" requirements).[30] These criteria have proven to be durable over time, as they have been reinscribed in each subsequent revision to the UPOV Convention since the 1961 version entered into force in 1968. Moreover, even some countries that have not acceded to the Convention have conceptualised plant varieties according to the parameters of DUS.[31] The notions of distinctness, homogeneity/uniformity, and stability are defined only generally in the UPOV Convention. Therefore, it is expected that UPOV member States elaborate these concepts in sufficiently concrete terms in national level regulations to facilitate the realisation of a "DUS test": a technical examination based on which plant breeders' rights may be awarded.[32]

The origin of the concept of distinctness traces its source to laws governing certification and trademarks already in existence at the time of the making of the first version of the UPOV Convention, while also being influenced by the United States Plant Patent Act.[33] In UPOV 1961, this criterion was met when "the new variety [is] clearly distinguishable by one or more important characteristics from any other variety whose existence is a matter of common knowledge at the time when protection is applied for."[34] The existence of common knowledge about the variety was to be established under the 1961/1972 and 1978 frameworks through reference to factors such as cultivation or marketing already in progress, entry in an official register of varieties, or inclusion in a reference collection or precise description in a publication.[35] Meanwhile, applicants could prove that their varieties were distinct through reference to morphological or physiological characteristics, provided that these were capable of precise description and recognition.[36]

The 1991 version of the UPOV Convention relaxed the criteria for distinctness. This requirement is defined in UPOV 1991 as being met by a variety that "is clearly

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[30] A protectable variety must also be assigned a name or denomination enabling identification of the new variety. UPOV 1961 Art. 13; UPOV 1978 Art. 13; UPOV 1991, Art. 20.
[31] Examples include Cambodia, India, Indonesia, Malaysia, Pakistan, the Philippines, and Thailand. *See* Adhikari, K. & Jefferson, D. J. (eds.) (2019, forthcoming). *Intellectual Property Law and Plant Protection: Challenges and Developments in Asia.* Abingdon, UK: Routledge. (in prep).
[32] *See* UPOV (2002) General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants. TG/1/3.
[33] Sanderson, *supra* note 21 at 118.
[34] UPOV 1961/1972, Art. 6(1)(a); UPOV 1978 Art. 6(1)(a).
[35] *Id*.
[36] *Id*.

distinguishable from any other variety whose existence is a matter of common knowledge at the time of the filing of the application."[37] The rationale behind removing the qualifying phrase "important characteristics" from the definition was based on confusion surrounding the original formulation of distinctness. The former articulation suggested that a variety must be distinct from existing varieties "by some feature related to merit," which was never the intention of the Convention.[38] In fact, proposals to include a criterion for plant breeder's rights protection based on "usefulness" were rejected at the Second Session of the UPOV Diplomatic Conference held in 1961, due to the difficulties associated with making qualitative determinations about the value of new plant varieties.[39]

Meanwhile, the requirement of homogeneity was originally included in UPOV 1961 as an assurance that growers who purchase plant material could be confident that the variety would exhibit the characteristics for which it had been bred.[40] Plants are variable by nature, so the homogeneity requirement was designed to limit variation to some acceptable amount, which is left unspecified in all versions of the UPOV Convention. The definition of homogeneity under the 1961/1972 and 1978 versions of UPOV required that a new plant variety be "sufficiently homogeneous, having regard to the particular features of its sexual reproduction or vegetative propagation."[41]

Homogeneity was substituted by the term uniformity in UPOV 1991. Under the new formulation, a variety "shall be deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics."[42] UPOV guidance documents on conducting DUS testing clarify that the examination of uniformity may consider any obvious characteristic of a variety, and that the level of uniformity should be assessed in the

[37] UPOV 1991, Art. 7.
[38] Greengrass, B. (1991). Legislative Comment: The 1991 Act of the UPOV Convention. *European Intellectual Property Review, 13*(12), 466-475: 468.
[39] Heitz, A. (1991) The Nature and Rationale for the Protection of Plant Varieties. *Seminar on the Nature of and Rationale for the Protection of Plant Varieties under the UPOV Convention.* Organized by the International Union for the Protection of New Varieties of Plants in cooperation with the Government of the Republic of Hungary. Budapest, Hungary, September 19-21, 1990. pp. 38.
[40] Sanderson, *supra* note 33 at 117.
[41] UPOV 1961/1972 Art. 6(1)(c). *See also* UPOV 1978 Art. 6(1)(c).
[42] UPOV 1991 Art. 8.

context of the reproductive biology of the specific species to which the variety pertains.[43]

The final criterion, stability, was defined in UPOV 1961/1972 such that a variety needed to "be stable in its essential characteristics, that is to say, it must remain true to its description after repeated reproduction or propagation."[44] This definition remained unchanged in the 1978 version of the UPOV Convention. The sole significant change to the formulation of the stability requirement in UPOV 1991 was the substitution of the word "relevant" for "essential" in the description of the characteristics that must remain stable over time. As with the changes to the definition of uniformity in UPOV 1991, this revision may be understood as purely linguistic, with no change intended to the substance of the requirements for protection.[45] As a practical matter, the requirements of homogeneity/uniformity and stability are linked, in that DUS examiners generally take stability for granted once uniformity has been established.[46]

The conceptualisation of the plant variety that has been popularised through the various iterations of the UPOV Convention – as well as through concomitant seed certification laws – focuses essentially on varieties that formal plant breeders develop. The conditions of novelty, distinctness, uniformity, and stability as requirements to obtain intellectual property protection operate to universalise the UPOV system, while ostensibly ensuring that exclusive rights only encumber plant varieties that are of high quality and markedly improved performance. This prioritisation does not recognise other types of plants, such as the crops that farmers develop either as traditional landraces[47] or through participatory breeding programmes, which are typically more genetically heterogeneous.[48] Wild-type plants are also expressly excluded from the conceptualisation of the variety, since UPOV considers these to not have been

[43] UPOV (2002) General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants. Chapter 6. UPOV Publication TG/1/3.
[44] UPOV 1961/1972. Art. 6(1)(d).
[45] Greengrass, *supra* note 38 at 469.
[46] Janis, M. D., & Smith, S. (2007). Technological Change and the Design of Plant Variety Protections Regimes. *Chicago-Kent Law Review, 82*(3), 1557-1615: 1583.
[47] "Landraces" may be understood as "plant materials consisting of cultivated varieties that have evolved and may continue evolving, using conventional or modern breeding techniques, in traditional or new agricultural environments within a defined ecogeographical area and under the influence of local human culture." Casanas, F., Simo, J., Casals, J., & Prohens, J. (2017). Toward an Evolved Concept of Landrace. *Frontiers in Plant Science, 8*(145), 1-7: 2.
[48] Louwaars, N., & Burgaud, F. (2016). Variety Registration. In M. Halewood (ed.) *Farmers' Crop Varieties and Farmers' Rights: Challenges in Taxonomy and Law.* New York: Routledge.

intentionally improved by a human breeder. As the influence of the UPOV Convention has grown over the past two decades, so too has the notion of the plant variety as a standardised, easily identifiable and marketable construct.

The evolution of the plant variety as a discrete concept was facilitated and consolidated by advancements in genetics and molecular biology that beginning in the 1970s and 1980s were increasingly applied to plant breeding practices. These evolving laboratory-based techniques included protocols for molecular marker based trait selection and genetic modification.[49] Breakthrough innovations in plant genetic transformation coincided with a shift in the central locus of breeding activity in many industrialised countries, from the public to the private sector.[50] As transgenic crops were granted initial regulatory approvals to be commercialised in many territories, the private seed industry became increasingly vertically integrated and dominated by a small number of transnational corporations, shifting away from a formerly competitive agribusiness sector that was predominantly comprised of small and frequently family-owned businesses.[51]

These scientific and economic dynamics corresponded with and contributed to an expansion in the utilisation of different types of intellectual property laws to obtain exclusive rights over the uses of agricultural plants. Beginning in the 1980s, United States Supreme Court decisions clarified that in addition to the specialised plant patent regime, utility patents can be used to protect plants as intellectual property in that country.[52] This development meant that even sexually-reproducing species of plants became eligible for patent protection in the United States, provided that they meet the standard requirements of novelty, non-obviousness, utility, and written description.

Meanwhile, in 1998 the European Union clarified that biotechnological inventions not confined to a particular plant variety could be patentable under the terms of the European Patent Convention.[53] During this period, other industrialised

[49] Kloppenburg, J. R. (2004). *First the Seed. The Political Economy of Plant Biotechnology, 1492-2000*. Madison, WI: University of Wisconsin Press.
[50] Buttel, F. H. & Belsky, J. (1987). Biotechnology, Plant Breeding, and Intellectual Property: Social and Ethical Dimensions. *Science, Technology, & Human Values, 12*(1), 31-49.
[51] Howard, P. H. (2009). Visualizing Consolidation in the Global Seed Industry: 1996-2008. *Sustainability, 1*(4), 1266-1287.
[52] *Diamond v. Chakrabarty,* 447 U.S. 303 (1980) (holding that a live, human-made micro-organism is patentable subject matter); *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.*, 534 U.S. 124 (2001) (holding that newly developed plant varieties fall within patentable subject matter and that neither the U.S. Plant Patent Act nor Plant Variety Protection Act limit the scope of this coverage).
[53] Directive 98/44/EC of the European Parliament and of the Council (6 July 1998) On the legal protection of biotechnological inventions. L 213/13.

countries also modified their patent statutes to permit plant breeders to obtain patent protection for new plant varieties, so long as other the other requisite eligibility criteria were fulfilled.[54] Such was the case in Japan, Australia, and New Zealand. In these and other industrialised territories, the range of patentable plant related inventions has today grown to encompass a broad range of subject matter, which may include new plant varieties; genetic components such as genes or chromosomes; reproductive material such as seeds, whole plants, cuttings or protoplasts; and plant products such as fruit, flowers, or oils.

Concurrent with the increased utilisation of patents to obtain proprietary rights for plants, plant breeders' rights frameworks – especially as embodied in the UPOV Convention – began to proliferate worldwide beginning in the 1990s. Although these systems had already been in place in certain European and other industrialised countries for decades, it was only following the inclusion of the mandate contained in Article 27.3(b) in the TRIPS Agreement that developing countries in multiple world regions began to enact plant breeders' rights legislation. Since TRIPS entered into force in 1995, numerous territories have joined the UPOV Convention or otherwise have enacted *sui generis* legislation to meet the Article 27.3(b) requirement.

Even the legally unbound least developed countries that are members of the World Trade Organization have begun to enact domestic plant breeders' rights legislation – often modelled on the UPOV Convention – in anticipation of the need to become TRIPS compliant by July 2021.[55] The fact that legally unbound countries have in some cases accepted the UPOV model without exploring the possibility of designing locally tailored legislation illuminates the extent to which the plant breeders' rights paradigm has impacted the landscape of intellectual property for plants worldwide. This phenomenon is exemplified in the cases of Cambodia and Laos. Both countries are currently legally unbound, as least developed members of the World Trade Organization, and both enacted UPOV 1991 compliant plant breeders' rights laws well

[54] Helfer, L. R. (2004). *Intellectual Property Rights in Plant Varieties: International Legal Regimes.* FAO Legislative Study No. 85. Rome: Food and Agriculture Organization of the United Nations. pp. 42.

[55] In fact, many least developed countries already have *sui generis* plant breeders' rights laws in place or have joined the UPOV Convention and will therefore be required to implement such legislation in the near future. Such States include Benin, Bhutan, Burkina Faso, Cambodia, Central African Republic, Chad, Congo, Ethiopia, Guinea, Guinea-Bissau, Lao PDR, Mali, Mauritania, Myanmar, Niger, Senegal, Togo, and Zambia.

in advance of when their governments will be obligated to uphold the TRIPS Article 27.3(b) requirement.[56]

To date, numerous policy analyses have been conducted with the goal to identify the flexibilities or formal policy space that World Trade Organization Member States could exploit to interpret the Article 27.3(b) requirement in a way that would take into account the interests of diverse social actors.[57] However, the fact that few countries have elected to exercise their ability to enact locally tailored intellectual property legislation to fulfil their obligations under TRIPS means that the usefulness of these studies is limited to a handful of countries that are listed in Table 2 above. This is because most countries have elected to join the UPOV Convention as a means to fulfil the TRIPS obligation.

The popularity of the UPOV model may be explained by numerous factors, including the additional obligations that other international instruments, such as free trade agreements regularly contain; a lack of clarity or awareness surrounding how to design a national intellectual property law for plants that would deviate from the UPOV model; or pressure exerted by external or internal actors on the lawmaking process. All of these possible explanations suggest that the growth of membership in the UPOV Convention has itself become reinforcing of the logic of plant breeders' rights, a phenomenon that further limits imaginaries for innovative lawmaking at the national level.

On a practical level, this burgeoning membership in the UPOV Convention means that it is no longer sufficient to understand the nature of the TRIPS Article 27.3(b) requirement alone. Instead, it has become increasingly necessary to explore the possibilities for experimental lawmaking that exist in the context of the UPOV Convention – especially its 1991 version, to which seventy-eight countries are currently bound. To date, no systematic analysis has been conducted to assess how

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[56] Jefferson, D. J. (2019, forthcoming). The Proliferation of Plant Breeders' Rights in Asia: Tracking the Spread of UPOV through Trade Agreements. In K. Adhikari & D. J. Jefferson (eds.) *Intellectual Property Law and Plant Protection: Challenges and Developments in Asia*. Abingdon, UK: Routledge. (Note that Cambodia enacted its Law on Seed Management and Plant Breeder's Rights in April 2008, and Laos revised its national intellectual property law in 2011 to create a new system for plant variety protection based on UPOV 1991. Both frameworks entered into force more than 10 years before the TRIPS Article 27.3(b) requirement will take effect in these countries).

[57] *See, e.g.,* Dhar, B. (2002). Sui Generis Systems for Plant Variety Protection: Options under TRIPS. *Quaker United Nations Office, Geneva*; Robinson, D. (2008). Sui Generis Plant Variety Protection Systems: Liability Rules and Non-UPOV Systems of Protection. *Journal of Intellectual Property Law & Practice, 3*(10), 659-665.

national governments might customise the UPOV Convention toward the end of balancing the interests of diverse national stakeholders. The final section of Chapter 2 and Chapter 5 of this thesis will attempt to fill this gap by providing specific policy recommendations that national governments could consider. However, it will first be necessary to explore the criticisms associated with the UPOV model as an intellectual property framework for plants, as well as to scrutinise prior proposals for alternative means to meet the Article 27.3(b) requirement.

1.2. The UPOV Model for Intellectual Property in Plants

Notwithstanding – or perhaps, because of – the dominance of the logic of plant breeders' rights in the landscape of intellectual property for plants, some social actors have criticised the UPOV system. Rather than centre on the UPOV Convention itself, critiques are often concerned with the applicability of this model to certain local contexts. Opposition to UPOV has also grown and consolidated over time as the Convention has evolved to expand the protections granted to right holders while reducing the available exceptions to exclusivity. One of the essential areas in which UPOV has developed pertains to the conceptualisation of the plant variety. While the notion of the plant variety in UPOV 1961 was derived fundamentally from horticultural and plant breeding knowledge and practices, the concept has been subsequently rendered increasingly political and legal.[58]

Thus, UPOV 1991 expanded the plant variety concept to provide protection for new categories of "essentially derived" and other varieties that are not clearly distinguishable from a previously protected variety.[59] Meanwhile, the periods of protection for the breeder's right were lengthened[60] and the corresponding exceptions – allowing for the use of a protected variety without the authorisation of the breeder

[58] Sanderson, *supra* note 33 at 113.
[59] In addition to "initial varieties," UPOV 1991 provides protection for "(i) varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety; (ii) varieties which are not clearly distinguishable in accordance with Article 7 [distinctness] from the protected variety and; (iii) varieties whose production requires the repeated use of the protected variety." Art. 5(a).
[60] The minimum period of protection under UPOV 1991 is 20 years from the date of the grant of the breeder's right (25 years for trees and vines), while the minimum period of protection under UPOV 1978 was 15 years (18 years for trees and vines).

under certain circumstances – were curtailed.[61] These changes have contributed to an increase in the number of genera and species eligible for protection, which in turn has driven the growth of the overall volume of breeders' rights certificates that have been granted worldwide.[62] The key differences between the 1978 and 1991 versions of the UPOV Convention are displayed in Table 6. As can be inferred from this table, the latter version of the UPOV Convention represents a substantial expansion of the scope of protection granted in comparison to the former.

Table 6: Comparison of UPOV 1978 and UPOV 1991

PROVISION	UPOV 1978	UPOV 1991
Botanical genera & species protected	At least 5 upon entry into force; 10 within 3 years; 18 within 6 years; 24 within 8 years.	At least 15 upon becoming bound; all genera and species within 10 years.
Scope of protection	Breeder's authorisation required for: (i) production for purposes of commercial marketing; (ii) offering for sale; (iii) marketing.	Breeder's authorisation required for: (i) production or reproduction (multiplication); (ii) conditioning for the purpose of propagation; (iii) offering for sale; (iv) selling or other marketing; (v) exporting; (vi) importing; (vii) stocking for purposes mentioned in (i) to (vi).
Material that may be protected	• Plant varieties	• Plant varieties • Harvested material • Products made directly from harvested material (optional) • Essentially derived varieties • Varieties that are not clearly distinguishable • Varieties whose production requires repeated use of the protected variety
Exceptions	• Acts done for non-commercial purposes (implied)	• Acts done privately **and** for non-commercial purposes

[61] For instance, UPOV 1978 implicitly allowed farmers to save seeds for personal uses, but not resale. UPOV 1991 eliminates this "farmer's privilege," though it does grant discretion to national governments to decide whether seed saving should be permitted in domestic legislation. *See* UPOV 1991, Art. 15(2).
[62] Jördens, *supra* note 23 at 241.

PROVISION	UPOV 1978	UPOV 1991
	• Utilisation of the protected variety for creating other varieties or for the marketing of such varieties.	• Acts done for experimental purposes • Acts done for the purpose of breeding other varieties • Use by farmers for propagating purposes, on their own holdings, the product of the harvest (optional).
Period of exclusivity	18 years from date of issue (trees and vines) 15 years from date of issue (all other species).	25 years from the date of issue (trees and vines) 20 years from the date of issue (all other species).
Relationship with patent law	A variety of the same botanical genus or species may be protected with either plant breeders' rights or a patent.	A variety of the same botanical genus or species may be protected with both plant breeders' rights and a patent.

Following the expansion of the form of plant breeders' rights granted according to the UPOV model, certain individuals and groups have increasingly voiced opposition to the idea that plants should be conceived as intellectual property in any form. Critics have responded to the adhesion of an increasing number of territories – including developing and least developed countries – to the UPOV Convention by declaring its provisions to be inappropriate for the forms of agriculture typically practiced outside of wealthy, industrialised nations.[63] The 1991 version of the UPOV Convention has been especially derided as potentially limiting small-scale farmers' practices of seed saving and exchange in customary farmer-to-farmer seed networks, which could possibly operate to curtail access to protected seeds and jeopardise farmers' right to food.[64] Governments of developing countries that have considered joining UPOV as a means to implement a *sui generis* system of intellectual property for plants have in some cases been met with fierce opposition from civil society actors.[65] Based on concerns about the need to balance the rights of plant breeders

[63] *See, e.g.,* GRAIN. (1998). Ten Reasons Not to Join UPOV. *Global Trade and Biodiversity in Conflict*, Issue 2, No. 2.
[64] *Owning Seeds, Accessing Food: A Human Rights Impact Assessment of Plant Variety Protection.* Factsheet published by Berne Declaration, Bread for the World – Protestant Development Service, Community Technology Development Trust (CTDT), Development Fund – Norway, Misereor, Searice, Third World Network. (January 2015).
[65] Such was the case with the "No to UPOV" campaign organised in Nepal beginning in 2003. Winge, T., Adhikari, K., & Andersen, R. (2013). Advocacy for Farmers' Rights in Nepal. In R. Andersen & T. Winge (eds.) *Realising Farmers' Rights to Crop Genetic Resources: Success Stories and Best Practices.* Abingdon, UK: Routledge.

with those of other national stakeholders, several proposals for *sui generis* alternatives to the UPOV model for plant breeders' rights have been launched.[66]

In fact, non-UPOV *sui generis* intellectual property laws for plants – typically conceived under the rubric of "plant variety protection" – have already been successfully implemented in several countries, such as India, Malaysia, and Thailand.[67] Typically, these laws are designed around the general aim of balancing the interests of multiple stakeholders in the national scientific, industrial, and agricultural domains. *Sui generis* plant variety protection laws have sought to realise this goal by generally following the UPOV model to grant protection to new, distinct, uniform, and stable varieties, while also recognising other types of protection. These have included mechanisms to safeguard farmers' interests as the custodians and developers of native and local plant varieties, and protections for customary agricultural practices as means to conserve national agrobiodiversity.

Prominent examples of non-UPOV countries that have enacted national level *sui generis* intellectual property laws for plants include India, which ratified its Protection of Plant Varieties and Farmers' Rights Act in 2001,[68] as well as Thailand[69] and Malaysia.[70] In these territories, intellectual property is available for different categories of plants, which correspond to distinct stakeholders. For instance, the Thai Plant Varieties Protection Act (1999) recognises intellectual property for new varieties; local domestic varieties; general domestic varieties; and wild varieties, while also establishing a fund to support the conservation, research, and development of plant varieties in local communities. These real policy initiatives form the basis of one of the most prominent proposals for *sui generis* alternatives to UPOV, which was authored by Carlos Correa.[71]

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[66] *See, e.g.,* Correa *supra* note 8; Ravishankar, A. & Archak, S. (1999). Searching for Policy Options: Is CoFaB a Suitable Alternative to UPOV? *Economic and Political Weekly, 34*(52), 3661-3667; De Jonge, B. & Munyi, P. (2016). A Differentiated Approach to Plant Variety Protection in Africa. *The Journal of World Intellectual Property, 19*(1-2), 28-52.
[67] *See, e.g.,* Kanniah, R. (2005). Plant Variety Protection in Indonesia, Malaysia, and the Philippines and Thailand. *The Journal of World Intellectual Property, 8*(3), 283-310; Lertdhamtewe, P. (2013). Plant Variety Protection in Thailand: The Need for a New Coherent Framework. *Journal of Intellectual Property Law & Practice, 8*(1), 33-42; Trustum-Behan, E., & Lawson, C. (2016). The Protection of Plant Varieties and Farmers Rights Act 2001 (In) and New Plant Varieties, Extant Varieties and Farmers' Varieties: A New Form of Property? *Australian Intellectual Property Journal, 27*(2), 73-87.
[68] The Protection of Plant Varieties and Farmers' Rights Act, 2001 of India (PPVFR Act).
[69] Plant Varieties Protection Act of Thailand, B.E. 2542 (1999).
[70] Protection of New Plant Varieties Act of Malaysia, Act 634 (2004).
[71] Correa, *supra* note 8.

The model that Correa proposes could provide a useful template for lawmakers in the first subcategory of legally bound countries listed in Table 1 above. This grouping includes World Trade Organization Member States that have not yet implemented an intellectual property law for plants in accordance with the TRIPS Article 27.3(b) obligation. However, the Correa proposal – like other, earlier models for *sui generis* systems of intellectual property for plants – fails to address the fact that many World Trade Organization Member States are also bound by international obligations beyond the TRIPS Agreement. While the idea of implementing a truly unique, *sui generis* law to regulate plants as intellectual property may be feasible in legally unbound countries and in territories that are only bound to TRIPS, many countries are also obligated to uphold various overlapping bilateral, regional, and multilateral commitments. For instance, numerous national governments, ranging geographically from Latin America to Eastern Europe to Africa, have already independently joined UPOV.

For such nations, the relevant exercise is not to understand the nature of the formal policy space that exists under the TRIPS Agreement for the purposes of implementing *sui generis* legislation for the protection of plants as intellectual property. Instead, the pertinent task is to identify how the UPOV Convention may be customised to implement plant breeders' rights while also appropriately taking into account the nuances of the national agricultural sector in a given country. The form that such a framework would take also depends on whether a country is bound to the 1978 version of the UPOV Convention – as is the case in many Latin American States – or UPOV 1991 – as are, for example, the members of the African Intellectual Property Organisation (OAPI). However, it is also notable that countries may no longer join UPOV 1978,[72] and as such, the 1991 version of the Convention has become the only relevant framework for countries that are considering accession to the Union in the future.

While many developing countries have independently adhered to UPOV, others have been required to ratify the Convention as the result of participation in intergovernmental organisations. Such is the case in the Andean Community, a regional body "voluntarily united with the objective of achieving integral, more

[72] In April 1999, the 1978 UPOV Convention officially ceased to accept new members. Deere, C. (2009). *The Implementation Game: The TRIPS Agreement and the Global Politics of Intellectual Property Reform in Developing Countries.* Oxford, UK: Oxford University Press. pp. 109.

balanced, and autonomous development"[73] that is comprised of Bolivia, Colombia, Ecuador, and Peru. In 1993, the Andean Community enacted its Decision No. 345, which establishes a common regime for the protection of plant breeder's rights.[74] Decision No. 345 amalgamates provisions from the 1978 and 1991 versions of the UPOV Convention. This example illustrates that even prior to the entry into force of the TRIPS Agreement, in certain territories the amount of formal policy space available for the making of domestic intellectual property laws for plants had already been reduced.

In the years since the TRIPS Agreement entered into force, many countries have executed bilateral or multilateral free trade agreements, whose provisions frequently include minimum criteria for national intellectual property laws to which signatories must adhere. Opponents have labelled these free trade agreements "TRIPS plus" regimes, because wealthy States have often required that developing countries implement intellectual property minimum standards that exceed those found in TRIPS, in exchange for enhanced market access.[75] One common provision that many free trade agreements contain is the condition that parties join the UPOV Convention, which either implicitly or explicitly means compliance with UPOV 1991. For such countries, identification of the formal policy space available for the making of national intellectual property laws for plants depends not on an assessment of the formal policy space available in the TRIPS Agreement, but rather on understanding the extent to which experimentation is possible in the context of the need to comply with the UPOV Convention.

1.3. Free Trade Agreements: The International Diffusion of Systems for Plant Breeders' Rights

In some world regions, countries have enjoyed relatively broad latitude to shape their intellectual property laws for plants according to local needs. As of 2018, countries such as India, Thailand, Malaysia, Nepal, and Sri Lanka were not bound to

[73] Comunidad Andina. (2017) "Qué es la CAN?" *Retrieved from* http://www.comunidadandina.org/Seccion.aspx?id=189&tipo=QU&title=somos-comunidad-andina.
[74] Comunidad Andina. (1993) Decisión No. 345 sobre el Régimen Común de Protección a los Derechos de los Obtentores de Variedades Vegetales.
[75] Helfer, L. R. (2009). Regime Shifting in the International Intellectual Property System. *Perspectives on Politics, 7*(1), 39-44.

the UPOV Convention, and they had also avoided entering into "TRIPS plus" free trade agreements. In these five countries, non-UPOV *sui generis* systems for the governance of plants as intellectual property had either already been implemented or were under consideration by the respective national legislatures.[76] In contrast, many countries in the Latin American region were either already UPOV members or had signed free trade agreements with territories such as the United States, the European Union, or others. In most instances, the trade treaties entered into between wealthy countries and Latin American States contained terms that required adherence to UPOV 1991. These provisions provoked significant controversy.

For instance, protests erupted over the requirement that Chile implement a plant breeders' rights law that would be compliant with UPOV 1991, which was included in a free trade agreement that the country executed with the United States in 2004.[77] Efforts to enact a national intellectual property law for plants began in Chile with the independent development and codification of the Regulation of the Rights of Breeders of New Plant Varieties Law in 1994.[78] This framework was essentially modelled on the 1978 version of the UPOV Convention, and Chile formally adhered to UPOV 1978 in 1996.[79] Subsequently, the country began to explore the possibility of negotiating trade treaties with relatively wealthier countries in the early 2000s. First, Chile and the European Union ("EU") signed an agreement that entered into force in 2003.[80] This treaty granted Chile a measure of flexibility surrounding the development of national plant breeders' rights legislation, requiring only that the country adhere to either UPOV 1978 or UPOV 1991.[81]

The accommodations under the EU-Chile free trade agreement were short-lived, as another treaty, this time with the United States, was signed and entered into force in 2004.[82] The United States-Chile agreement required the parties to "give effect

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[76] Adhikari and Jefferson, *supra* note 31.
[77] Jefferson, D. J. (2014). Development, Farmers' Rights, and the Ley Monsanto: The Struggle Over the Ratification of UPOV 91 in Chile. *IDEA – The Intellectual Property Law Review, 55*(1), 31-104.
[78] Ley No. 19.342 (17 de octubre de 1994) Biblioteca del Congreso Nacional de Chile, *available in English at* http://www.wipo.int/wipolex/en/details.jsp?id=807.
[79] UPOV Membership, *supra* note 27.
[80] Agreement establishing an association between the European Community and its Member States, of the one part, and the Republic of Chile, of the other part. November 18, 2002. 2002 O.J. (L352)3, *retrieved from* http://ec.europa.eu/world/agreements/downloadFile.do?fullText=yes&treatyTransId=879.
[81] *Id.* at Art. 170(a)(v).
[82] United States-Chile Free Trade Agreement (FTA) (January 1, 2004), *retrieved from* http://www.ustr.gov/trade-agreements/free-trade-agreements/chile-fta.

to" UPOV 1991 prior to 1 January 2009.[83] A similar agreement that Chile executed with Japan in March 2007 mirrored these terms, requiring adherence to UPOV 1991 by 1 January 2009.[84] A third free trade agreement, which was implemented between Chile and Australia and which entered into force in March 2009, required accession to UPOV 1991 by the same date as the other treaties: 1 January 2009.[85] Finally, in March 2018, Chile signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, a multilateral trade agreement between eleven States with borders on the Pacific Ocean. This Partnership states that each party will accede to UPOV 1991 by the date on which the agreement becomes binding, which was set to occur sixty days after ratification by fifty per cent of the signatories.[86]

Notwithstanding these numerous overlapping obligations, the process of implementing a UPOV 1991 compliant plant breeders' rights law in Chile has unfolded in a complicated and contentious manner. In response to Chile's non-compliance with its obligations under the various trade agreements discussed above, in March 2009 President Michelle Bachelet – then in her first term – introduced legislation in the national Congress whose purpose was to implement UPOV 1991.[87] Eventually the legislature approved the text of UPOV 1991 under the administration of President Sebastián Piñera in May 2013,[88] but the implementing regulations were never developed and therefore Piñera did not sign them before his term ended.

In an ironic twist, President Bachelet – this time in her second term – withdrew the draft regulations from consideration by the Congress, for the stated purpose of analysing the impact of the proposed regime on Chilean agricultural communities, and

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[83] *Id*. at Art. 17.1.3(a).
[84] Agreement Between Japan and the Republic of Chile for a Strategic Economic Partnership, March 27, 2007. *Retrieved from* http://www.wipo.int/wipolex/en/other_treaties/text.jsp?file_id=225073. Chapter 13, Article 162.
[85] Australia-Chile Free Trade Agreement, March 6, 2009. *Retrieved from* dfat.gov.au/trade/agreements/aclfta/Documents/Australia-Chile-Free-Trade-Agreement.pdf. Article 17.4(1)(c).
[86] Comprehensive and Progressive Agreement for Trans-Pacific Partnership, incorporating the provisions of the Trans-Pacific Partnership Agreement (TPP), February 4, 2016. Article 18.7(2)(d).
[87] Message of the President of the Republic to Initiate a Project in Accordance with the Approval of the International Convention for the Protection of New Varieties of Plants of December 2, 1961, Revised in Geneva through the Act of March 19, 1991 (Message No. 1435-356).
[88] Senate of Chile, Bulletin 6355-01 (July 7, 2013), *retrieved from* http://www.senado.cl/proyecto-que-regula-obtenciones-vegetales-surgen-dudas-en-materia-de-derechos-de-pequenos-agricultores/prontus_senado/2013-07-30/121930.html.

on Chilean native seeds.[89] To further complicate matters, Piñera was again elected to the presidency in 2017 after Bachelet's second term ended. As of 2018, the regulatory framework that would implement the new Chilean plant breeders' rights law was ostensibly still being reviewed, but no clarity had been provided as to how long the process might take. The delay provoked rebukes by the United States based on non-compliance with the trade agreement between that country and Chile,[90] while Chilean civil society organisations continued to condemn the implementation of a UPOV 1991 based law.[91]

A similar situation unfolded in Colombia surrounding the making of a revised national intellectual property law for plants. In 2006, Colombian authorities entered into a free trade agreement with the United States that required adherence to the 1991 version of the UPOV Convention.[92] Domestic legislation to institute a UPOV 1991 compliant plant breeders' rights regime was introduced in the national Congress and passed in 2012.[93] However, before the new framework could be implemented, the Colombian Constitutional Court struck down the law as unconstitutional.[94] The court held that the legislation had violated the fundamental right of indigenous and Afro-Colombian communities to be previously consulted about legislative or administrative measures that would affect them directly, which the judges reasoned to include the impact of a UPOV 1991 based law on customary seed management practices, as well as on the "natural development of local biodiversity."[95]

Subsequently, the Colombian government initiated a process to revise the law according to the mandates of the Constitutional Court. As of 2018, it was still unclear

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[89] *See Double Citizen Triumph: Monsanto Law and UPOV 91 Convention Withdrawn,* El Ciudadano (March 18, 2014), *retrieved from* http://www.elciudadano.cl/2014/03/18/103121/doble-triunfo-ciudadano-ley-monsanto-y-convenio-upov-91-en-retirada-2.
[90] United States Department of Agriculture (USDA) Foreign Agricultural Service GAIN Report (November 2016) Agricultural Biotechnology Situation in Chile 2016. GAIN Report Number: CI1631.
[91] *E.g.,* Sepúlveda, L. (1 de junio de 2016) La Ley Monsanto y el Acuerdo de las Transnacionales. *El Clarin, retrieved from* http://www.elclarin.cl/web/opinion/politica/19191-la-ley-monsanto-y-el-acuerdo-de-las-transnacionales-el-tpp.html.
[92] *Colombia FTA Final Text, Chapter 16, Art. 16.1(3)(c),* Office of the United States Trade Representative, Executive Office of the President, *retrieved from* http://www.ustr.gov/trade-agreements/free-trade-agreements/colombia-fta/final-text.
[93] Ley No. 1518, Congreso de la República de Colombia (13 de abril de 2012), *retrieved from* http://wsp.presidencia.gov.co/Normativa/Leyes/Documents/ley151813042012.pdf.
[94] *Comunicado No. 50,* Corte Constitucional de la República de Colombia (5-6 de diciembre de 2012), *retrieved from* http://www.corteconstitucional.gov.co/comunicados/No.%2050%20comunicado%2005%20y%2006%20de%20diciembre%20de%202012.php.
[95] *Id*.

how the situation would be resolved. Consultations with indigenous and Afro-Colombian groups were supposed to be held in 2017, but by late 2018, no reports on such dialogues had been made public. As with Chile, the United States government took notice of Colombia's non-compliance with its free trade obligations.[96] However, it was unclear whether external pressure would incite Colombian lawmakers to quickly pass a revised version of the plant breeders' rights law that would conform to the standards of UPOV 1991. The United States included Colombia in its Special 301 watchlist for several years due to non-compliance with UPOV 1991,[97] and the Colombian government had not responded as of 2018.

Another Andean country, Peru, has also experienced the impact of external forces on the making of a national law for the governance of plants as intellectual property. In April 2006, the United States-Peru Trade Promotion Agreement was signed, and the Peruvian Congress approved the treaty in June 2006.[98] Similar to the various trade agreements that the United States has executed with other countries in the region, the treaty with Peru required adherence to UPOV 1991 prior to 1 January 2008.[99] Peru did not meet this deadline. However, unlike its neighbours to the north and south, Peru did approve a UPOV 1991 compliant plant breeders' rights framework in November 2011.[100] Although the law was ultimately passed, news over the forthcoming implementation of a UPOV 1991-based regime sparked a lively national debate, in which numerous civil society organisations mobilised rural populations to protest against the legislation.[101] Following Peru's formal accession to UPOV 1991 in

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[96] United States Department of State (2018) "Colombia: 2018 Investment Climate Statements Report," *retrieved from* http://www.state.gov/e/eb/rls/othr/ics/investmentclimatestatements/index.htm?year=2018&dlid=281739. Office of the United States Trade Representative. 2018 Special 301 Report, *retrieved from* https://ustr.gov/sites/default/files/files/Press/Reports/2018%20Special%20301.pdf.

[97] Office of the United States Trade Representative. 2018 Special 301 Report, *retrieved from* https://ustr.gov/sites/default/files/301/2017%20Special%20301%20Report%20FINAL.PDF; Office of the United States Trade Representative. 2014 Special 301 Report, *retrieved from* https://ustr.gov/sites/default/files/USTR%202014%20Special%20301%20Report%20to%20Congress%20FINAL.pdf;

[98] Ministerio de Comercio Exterior y Turismo del Perú. "Acuerdos Comerciales del Perú: TLC Perú-EEUU." *Retrieved from* http://www.acuerdoscomerciales.gob.pe/index.php?option=com_content&view=category&layout=blog&id=55&Itemid=78.

[99] Acuerdo de Promoción Comercial Perú-EE.UU., Art. 16.1(3)(c).

[100] Supreme Decree No. 035-2011-PCM. Approving the Regulations for the Protection of the Rights of Breeders of New Plant Varieties. *Retrieved from* http://www.upov.int/upovlex/en/text.jsp?file_id=244355.

[101] The Berne Declaration. (2015). Owning Seeds, Accessing Food. A Human Rights Impact Assessment of UPOV 1991 Based on Case Studies in Kenya, Peru and the Philippines. *Retrieved*

August 2011, controversy persisted over the new plant breeders' rights law, with concerns centring on the potential impact that the regime could have on small-scale farmers, indigenous communities, and other marginalised groups.[102]

As enacted, the Peruvian legislation contains an exception to plant breeders' rights for individuals who save and sow protected seeds for personal use, within "reasonable limits" and so long as the "legitimate interests" of the breeder are safeguarded.[103] This represents the utilisation of a formal policy space within the scope of UPOV 1991 Article 15.2, by recognising a UPOV compliant version of the farmer's privilege in domestic law.[104] As of 2018, the prospective impact of the new Peruvian plant breeders' rights framework was difficult to assess, given that the it had not yet been fully implemented. However, one recent study that conducted an *ex ante* impact assessment of the Peruvian regime concluded that the new law could adversely affect small-scale farmers' access to seeds through customary farmer-to-farmer exchange networks.[105] The study's authors further argued that the law could undermine cultural rights, minority rights, indigenous peoples' rights, women's rights, as well as biodiversity and the right to food.[106]

In Ecuador, the story is consonant with the histories of neighbouring countries in the Andean region. Beginning in 2004 Ecuador – along with Peru and Colombia – commenced negotiations with the United States of America ("US") surrounding the possibility of executing a US-Andean regional free trade agreement.[107] However, following two years and fifteen rounds of talks, the Ecuadorian authorities decided to pull out of negotiations towards the potential treaty. Among the reasons cited for the impasse were concerns over the trade of agricultural goods and the protection of intellectual property, especially pertaining to access to medicines and agrochemical products.[108]

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from https://www.publiceye.ch/fileadmin/files/documents/Saatgut/2014_07_10_Owning_Seed_-_Accessing_Food_report_def.pdf.

[102] *Id.*

[103] Supreme Decree No. 035-2011-PCM, *supra* note 100 at Art. 16.

[104] Note that the Peruvian framework prohibits the exchange and sale of protected seeds by farmers while the use of harvested products (i.e., farm-saved seeds) is allowed so long as the seeds have been obtained on the farmers' own holdings and are used on their own holdings. *Id.*

[105] The Berne Declaration, *supra* note 101.

[106] *Id.*

[107] The Office of the United States Trade Representative. "Peru and Ecuador to Join with Colombia in May 18-19 Launch of FTA Negotiations with the United States." (3 May 2004).

[108] International Centre for Trade and Sustainable Development (ICTSD). "TLC Ecuador – EEUU: negociación se complica por Ley de Hidrocarburos." *Puentes* (11 April 2006).

While the participation of Ecuador in the US-Andean agreement stagnated, beginning in 2007 the country entered into a dialogue with the European Union surrounding a potential trade treaty.[109] For years, disagreements over intellectual property beset the negotiations between Ecuador and the European Union. The fight reached a climax in January 2014, when Ecuadorian President Rafael Correa announced that negotiations would be suspended.[110] However, talks restarted just two months later in March 2014, with Ecuador hopeful that the European Union would not cross the "red lines" the country's leaders had traced around certain intellectual property concerns.[111]

The tensions that the possible trade agreement provoked were felt by officials throughout Ecuadorian government, including in administrative agencies far removed from the treaty negotiations. Thus, the bureaucrats who had been charged with comprehensively revising the national system for intellectual property used drafting tactics to put pressure on the European Union to accede to Ecuador's demands. According to officials involved with the making of the new intellectual property law, the strategy was to include strong or "radical" provisions – such as shortening the period of copyright protection or expanding the grounds for granting compulsory licenses for patented goods – so that Ecuadorian negotiators would enjoy greater bargaining leverage during talks with European Union representatives.[112]

This approach saw some success. In early 2016, when the fate of both the European Union-Ecuador free trade agreement and the prospective new Ecuadorian intellectual property law were uncertain, officials leading the European Union Delegation in Ecuador confided that they were concerned over both the general tone as well as certain specific provisions of early drafts of the legislation.[113] Ecuadorian media commentators fed this apprehension, arguing that Europe grants "a special importance [to] its intellectual property to gain a dominant position in technology and

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[109] Coral, M. L. (2013). Ecuador-Unión Europea: Lógicas de Una Negociación Inconclusa. Friedrich, Ebert, Stiftung Foundation, *retrieved from* http://library.fes.de/pdf-files/bueros/quito/10376.pdf.
[110] Rafael Correa: *Ecuador no Firmará un Tratado de Libre Comercio con la Unión Europea*, LibreRed (22 January 2014). *Retrieved from* http://www.librered.net/?p=31786.
[111] *Ecuador y la UE Retoman Negociación con Expectativas en Propiedad Intelectual, Contratación Pública y Aranceles,* Agencia Pública de Noticias del Ecuador y Suramérica (24 March 2014), *retrieved from* http://www.andes.info.ec/es/noticias/ecuador-ue-retoman-negociacion-expectativas-propiedad-intelectual-contratacion-publica.
[112] Director level official from the Ecuadorian Intellectual Property Institute (IEPI). (16 April 2016). Personal interview.
[113] Official with the European Union Delegation in Ecuador. (24 March 2016). Personal interview.

knowledge," a perspective they deemed to be "absolutely incompatible" with the contemporary strategy in Ecuador which aspired to "democratise knowledge."[114]

Notwithstanding the fraught nature of the negotiation process, Ecuador and the European Union ultimately signed their free trade agreement in November 2016. Technically, the nature of the treaty was such that Ecuador agreed to adhere to an existing trade treaty that the European Union had previously finalised with Colombia and Peru.[115] As with most of the free trade agreements executed between Latin American countries and relatively wealthier nations from other regions, the European Union-Ecuador agreement contains language related to adherence to the UPOV Convention. The plant breeders' rights section of this agreement states that "[t]he Parties shall cooperate to promote and ensure the protection of plant varieties based on [the UPOV Convention], as revised on 19 March 1991."[116] However, this provision includes a footnote clarifying that "[a]t the moment of signature of this Agreement, [UPOV 1978] applies for Ecuador."[117]

The inclusion of this language is indicative of the fact that, according to Ecuadorian officials familiar with the negotiations, the language of the agreement was non-negotiable. Thus, the only area in which Ecuadorian negotiators were able to influence the final form that the text assumed was in the footnotes.[118] In comparison to attempts to persuade other countries in the Andean region to adhere to UPOV 1991 – as illustrated in the cases of Chile, Peru, and Colombia – the footnote in the European Union-Ecuador agreement appears to be a small but significant victory for the Ecuadorian negotiators. Few other Latin American countries have successfully secured an exception to the obligation to join UPOV 1991 that trade treaties regularly contain.

Nevertheless, the ambiguity in the language about which version of the UPOV Convention is relevant for Ecuador means that it is unclear if, and if so, when the

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[114] Serrano, A. (20 January 2014). "Por Qué Ecuador No Debe Firmar Un Acuerdo Comercial Con la UE?" Telesur. *Retrieved from* http://www.telesurtv.net/articulos/2014/01/20/por-que-ecuador-no-debe-firmar-un-acuerdo-comercial-con-la-ue-5311.html.

[115] Ministerio de Comercio Exterior del Ecuador (n/d) "Acuerdo Comercial Ecuador – Unión Europea." *Retrieved from* http://www.comercioexterior.gob.ec/acuerdo-comercial-ecuador-union-europea/.

[116] Trade Agreement Between the European Union and its Member States, of the One Part, and Colombia and Peru, of the Other Part. Art. 232.

[117] *Id*. at FN 72b.

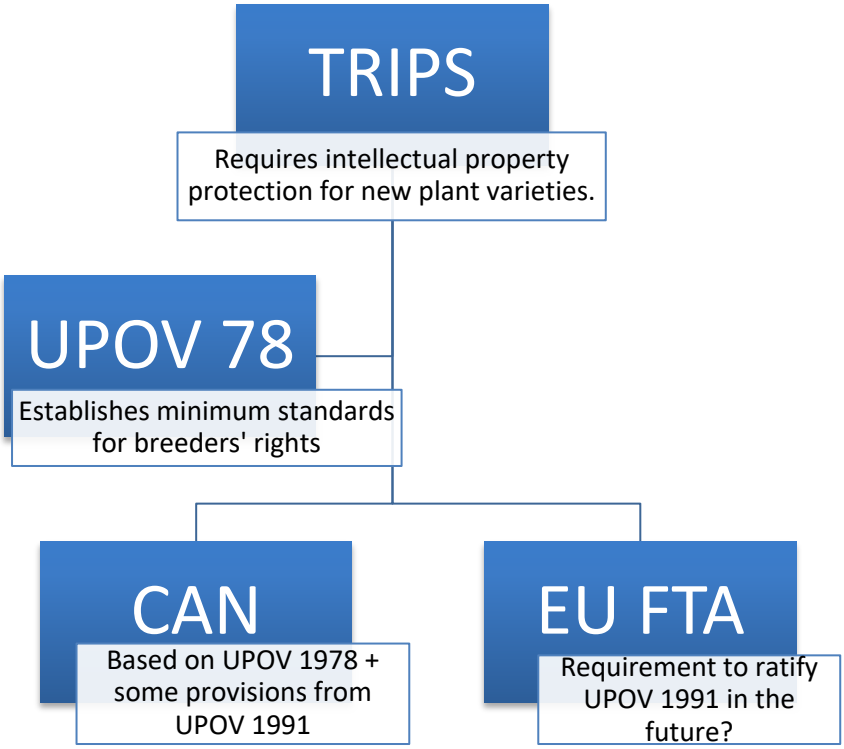
[118] Director level official from the Ecuadorian Intellectual Property Institute (IEPI). (16 April 2016). Personal interview. Contractor with IEPI involved with the making of the new intellectual property law (17 May 2016) Personal interview.

country might be required to revise its new intellectual property law for plants. Depending on how the free trade agreement with the European Union is interpreted and enforced, Ecuador might be required to reform its plant breeders' rights legislation to ensure compliance with UPOV 1991. If this were to occur, certain provisions of the country's current, UPOV 1978-based system would likely need to be revised. For instance, the exceptions to plant breeder's rights protection[119] and the duration of exclusivity granted to protected varieties[120] specified in the extant framework would need to comply with Article 15(2) and Article 19(2) of UPOV 1991, respectively. Chapter 4 of this thesis will discuss these provisions in detail, focusing particularly on their compliance with the UPOV Convention.

The various overlapping international obligations to which Ecuador is subject in relation to the governance of plants as intellectual property are rendered visible in Figure 4. As can be seen in this diagram, the TRIPS Agreement establishes the general obligation to provide some form of intellectual property for plants. Meanwhile, Ecuador is also legally bound to recognise a form of plant breeders' rights consonant with the UPOV Convention, based on its participation in both the Andean Community and the European Union-Ecuador free trade agreement. Together, these commitments circumscribe the formal policy space available to Ecuador to experiment with innovative approaches to intellectual property for plants.

[119] *See, id.* at Art. 15.
[120] *See* International Convention for the Protection of New Varieties of Plants (revised March 19, 1991), Art. 19.

Figure 4: International Agreements that Affect Lawmaking in Ecuador



The free trade agreements between the United States and the European Union on the one hand, and countries from the Andean region on the other, represent overt external forces that affect the form that national intellectual property legislation for plants can assume. Furthermore, negotiations towards trade agreements are often infused with covert influences, such as behind-the-scenes pressures that each party exerts as bargaining tactics. In some instances, non-legal forces do not operate in a clandestine manner, such that the existence of external pressure is obvious. This is the case in the Special 301 report that the United States publishes annually as a means to officially discredit its trading partners' practices in relation to the protection of intellectual property.

Dynamics that are internal to the negotiating parties' respective governments also contribute to the obligations that free trade agreements establish. For instance, the effectiveness of local actors at influencing the legislative process can result in the adoption of a particular model of intellectual property for plants at the national level, which in turn can influence that country's foreign policy. In countries whose agricultural sectors are industrialised, in which the majority of planting material is purchased from commercial breeders, lobbyists have been able to convince their political representatives that a system of plant breeders' rights based on the UPOV Convention

is in the national interest. In other countries, civil society actors have spearheaded popular mobilisations that have convinced their governments to officially reject the UPOV model.[121]

Despite the nuances that differentiate free trade agreement negotiations from one case to the next, the basic story in Chile, Colombia, Peru, and Ecuador is remarkably similar. In fact, this narrative has become ubiquitous throughout the developed world. The United States has executed trade treaties with multiple other countries in Latin America,[122] and with developing countries in other world regions.[123] Essentially all of these agreements have required adhesion to UPOV 1991.[124] However, as of 2018, several parties to the trade agreements with the United States had failed to meet the specified timeline to comply with UPOV 1991, a fact that illustrates the contentious nature of this framework.[125]

The European Union has also signed numerous trade related treaties with developing countries. For instance, in October 2008 the European Union executed an Economic Partnership Agreement with a group of countries in the Caribbean region.[126] The "CARIFORUM" States that are party to this treaty are mostly small island nations and all are classified as developing countries.[127] The European Union-CARIFORUM Agreement does not explicitly mandate ratification of or accession to the 1991 version of the UPOV Convention. However, the treaty does require that all parties "provide for the protection of plant varieties in accordance with the TRIPS Agreement" and that they "shall consider acceding to…UPOV (Act of 1991)."[128]

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[121] Such was the case in Nepal, a country in which a "No to UPOV" campaign has been credited with the rejection of the UPOV Convention as a model for the national intellectual property law for plants. Winge, Adhikari, & Andersen, *supra* note 65.
[122] These countries include Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama.
[123] These countries include Bahrain, Jordan, Morocco, and Oman.
[124] However, it should be noted that the text of the U.S.-Morocco FTA states that "[e]ach Party shall ratify or accede to…the *International Convention for the Protection of New Varieties of Plants* (1991)," leaving undefined the date by which such accession should occur. United States – Morocco Free Trade Agreement. Article 15.1(2)(e).
[125] These countries include El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Bahrain.
[126] Economic Partnership Agreement between the CARIFORUM States, of the one part, and the European Community and its Member States, of the other part. Official Journal of the European Union. (30 October 2008) L 289/I/3.
[127] The CARIFORUM States party to the agreement are: Antigua and Barbuda; the Bahamas; Barbados; Belize; Dominica; the Dominican Republic; Grenada; Guyana; Haiti; Jamaica; St. Kitts and Nevis; St. Lucia; St. Vincent and the Grenadines; Suriname; and Trinidad and Tobago. *Id*.
[128] *Id*. at Art. 149(2).

Thus, the European Union-CARIFORUM Agreement contains a measure of flexibility for parties to develop non-UPOV *sui generis* regimes that would satisfy the obligation under TRIPS to provide a form of intellectual property protection for plants. However, a similar formal policy space is not available in the free trade agreements that the European Union has signed with many other developing countries. Over the past two decades, the European Union has executed various kinds of commercial treaties with Albania,[129] Algeria,[130] Armenia,[131] Azerbaijan,[132] Bangladesh,[133] Bosnia and Herzegovina,[134] Egypt,[135] Iraq,[136] Jordan,[137] Kosovo,[138] Lebanon,[139] Macedonia,[140] Moldova,[141] Montenegro,[142] and Serbia.[143] All of these instruments require that the parties comply with UPOV 1991, typically within three to five years after the date on which the agreement enters into force.

While the United States and the European Union are the territories that have in recent history been the greatest protagonists of the execution of bilateral and regional free trade agreements with developing countries, other wealthy nations have followed suit. For instance, Australia finalised a trade agreement with Chile in 2009 that required accession to UPOV 1991,[144] and Australian delegates are currently involved in negotiations with Peru and Indonesia towards the execution of similar treaties.

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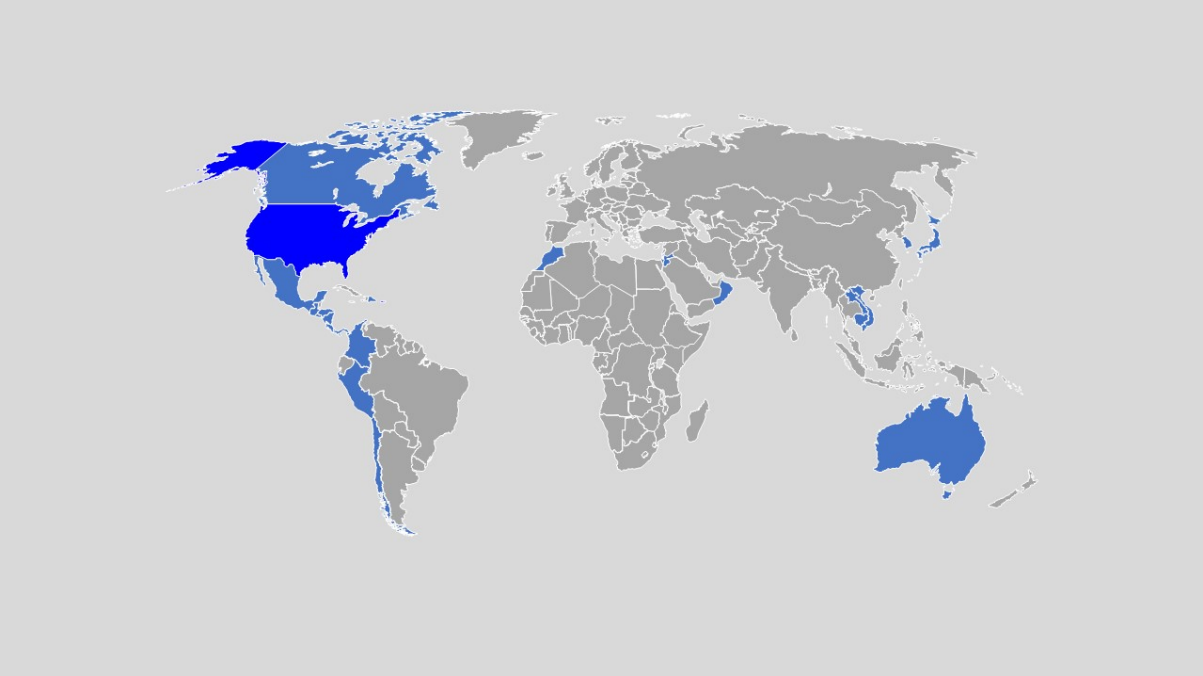
[129] Note that the EU-Albania agreement mandates adherence to *either* UPOV 1978 or UPOV 1991 by 31 December 2010. Albania became a member of UPOV 1991 on 15 October 2005. EU-Albania Free Trade Agreement (22 May 2006), Annex V, Art. 2(2)(d).
[130] EU-Algeria Association Agreement (1 September 2005), Annex 6, Art. 3.
[131] EU-Armenia Partnership and Cooperation Agreement (9 September 1999), Art. 42(2).
[132] EU-Azerbaijan Partnership and Cooperation Agreement (17 September 1999), Art. 42(2).
[133] EU-Bangladesh Cooperation Agreement (27 April 2001), Art. 4(5)(c).
[134] EU-Bosnia and Herzegovina Stabilisation and Association Agreement (1 June 2015), Annex VII, Art. 1.
[135] EU-Egypt Association Agreement (1 June 2004), Art. 37.
[136] EU-Iraq Partnership and Cooperation Agreement (11 May 2012), Art. 60(2).
[137] EU-Jordan Association Agreement (1 May 2002), Art. 56.
[138] EU-Kosovo Stabilisation and Association Agreement (1 April 2016), Art. 77(3).
[139] Note that the EU-Lebanon agreement mandates adherence to *either* UPOV 1978 or UPOV 1991 by 1 March 2008. However, as of 2017 Lebanon was still not a UPOV member, and as a practical matter the option to join UPOV 1978 in the future does not exist, as UPOV now only allows for accession to the 1991 version of the Convention. EU-Lebanon Free Trade Agreement (1 March 2003), Annex V, Art. 2(2).
[140] EU-Former Yugoslav Republic of Macedonia Stabilisation and Association Agreement (1 April 2004), Art. 71(3).
[141] Note that the EU-Moldova agreement mandates "protection of plant varieties rights, in accordance with the International Convention for the Protection of New Varieties of Plants including the optional exception to the breeder's right as referred to in Article 15(2) of the said Convention." While this does not explicitly mention UPOV 1991, the reference to Article 15(2) corresponds to the 1991 and not the 1978 version of the Convention. EU-Moldova Association Agreement (1 July 2016), Art. 317.
[142] EU-Montenegro Stabilisation and Association Agreement (29 April 2010), Art. 75(4).
[143] EU-Serbia Stabilisation and Association Agreement (1 September 2013), Art. 75(4).
[144] Australia-Chile Free Trade Agreement (6 March 2009), Art. 17.4(1)(c).

Likewise, Japan has free trade agreements in place with Chile,[145] Indonesia,[146] and Vietnam[147] that mandate the protection of plant varieties through frameworks that comply with UPOV 1991.

A world map displaying the various bilateral and regional trade agreements that the United States has executed with other territories, especially developing countries, is available in Figure 5. A similar map showing the agreements finalised between the European Union and mostly developing countries appears in Figure 6. Finally, two other relevant free trade agreements that contain terms requiring adhesion to the UPOV Convention are displayed in Figure 7. It is notable that one of the regional agreements in this latter figure has not yet been signed, namely the Regional Comprehensive Economic Partnership. While this agreement was still under negotiation in 2018, its potential impact is significant, given that it would bind nearly every country in Asia to the 1991 version of the UPOV Convention.[148]

Figure 5: United States Free Trade Agreements[149]



[145] Japan-Chile Economic Partnership Agreement (March 2007), Art. 162.
[146] Japan-Indonesia Economic Partnership Agreement (August 2007), Art. 116.
[147] Japan-Viet Nam Economic Partnership Agreement (December 2008), Art. 90.
[148] Single Working Document on the Intellectual Property Chapter Regional Comprehensive Economic Partnership (RCEP) Free Trade Agreement. (15 October 2015). Article 1.7(2)(j).
[149] Note that the United States has also executed free trade agreements that contain terms requiring adhesion to the UPOV Convention with Bahrain, Singapore, and Trinidad and Tobago. These countries are not highlighted in the Figure 5 map due to their small size.

Figure 6: European Free Trade Agreements[150]

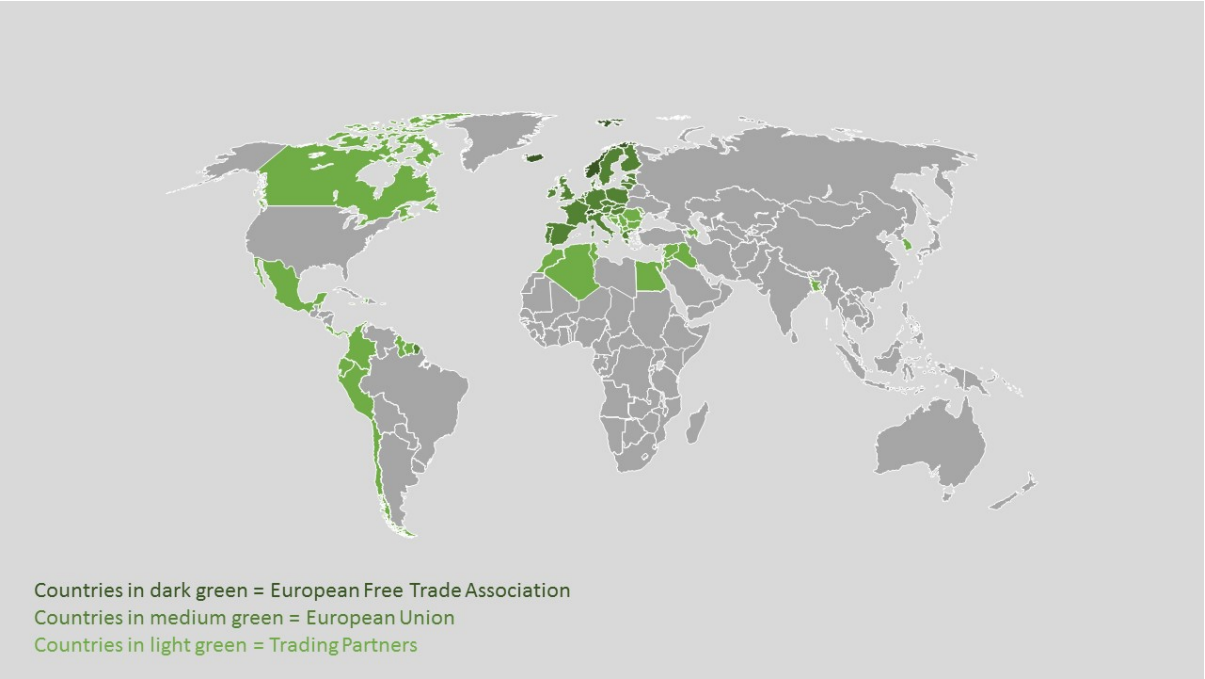
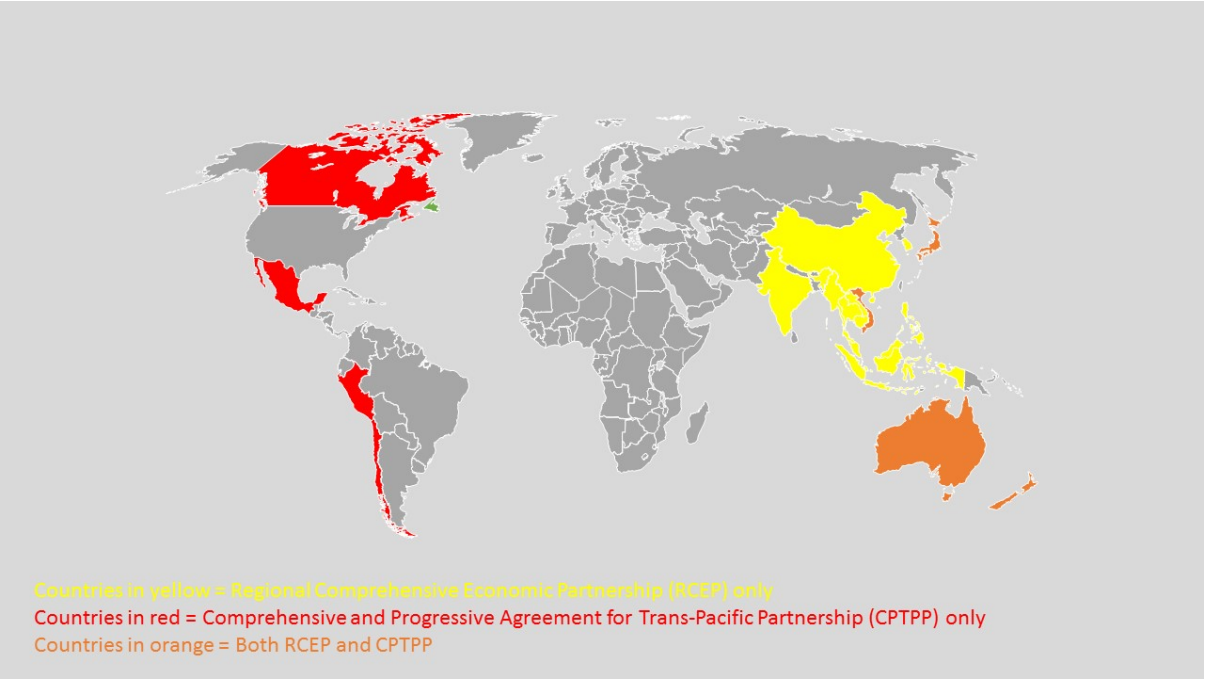


Figure 7: Other Free Trade Agreements[151]



[150] For the purposes of the map in Figure 6, "Europe" is considered to mean both the European Union (EU) and the European Free Trade Association (EFTA). The agreements that these two blocs have with developing countries were consolidated and are visible in light green. Note that the EU and the EFTA have also executed free trade agreements that contain terms requiring adhesion to the UPOV Convention with Antigua and Barbuda, the Bahamas, Barbados, Dominica, Grenada, Singapore, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, and Trinidad and Tobago. These countries are not highlighted in the Figure 6 map due to their small size.

[151] Note that the Brunei and Singapore are also parties to both the RCEP and the CPTPP. However, these countries are not highlighted in the Figure 7 map due to their small size.

Much of the criticism surrounding the 1991 version of the UPOV Convention has centred on the tension between granting proprietary rights to the creators of new plants and protecting other national interests such as customary agricultural practices and agrobiodiversity. While such conflicts frequently manifest in protests and debates over the execution of free trade agreements that regularly occur in developing countries, their existence is not usually acknowledged in the text of the agreements themselves. One exception to this trend is embodied in the United States-Central American Free Trade Agreement. In a footnote to the provision that requires each party to ratify or accede to UPOV 1991, the essential debate is laid bare:

> "The Parties recognize that *the UPOV Convention 1991 contains exceptions to the breeder's right, including for acts done privately and for non-commercial purposes, such as private and non-commercial acts of farmers*. Further, the Parties recognize that the UPOV Convention 1991 provides for restrictions to the exercise of a breeder's right for reasons of public interest, provided that the Parties take all measures necessary to ensure that the breeder receives equitable remuneration. The Parties also understand that each Party may avail itself of these exceptions and restrictions. Finally, the Parties understand that *there is no conflict between the UPOV Convention 1991 and a Party's ability to protect and conserve its genetic resources*."[152]

This language appears extraordinary against the backdrop of the typically stoic text found in free trade agreement provisions requiring adhesion to UPOV 1991. Furthermore, the footnote in the United States-Central American Free Trade Agreement evidences one of the principal arguments of this thesis: that countries may still experiment with the available formal policy space to design locally adapted intellectual property laws for plants, even when they are members of the UPOV Convention. However, considerable uncertainty surrounds the nature of this space and how it may be utilised to ensure that diverse national interests are effectively safeguarded.

Concomitant with the expansion and global extension of laws granting intellectual property for plants, in recent decades numerous other international treaties related to agriculture and plant genetic resources have entered into force. Several important frameworks have set standards for the protection of, for example, customary

[152] U.S.-Central America Free Trade Agreement (CAFTA), Article 15.1(5)(a), FN 1 (emphasis added).

agricultural practices, access and use of biological and genetic resources, agrobiodiversity conservation, and the rights of indigenous and traditional peoples. Relevant multilateral instruments include especially the Convention on Biological Diversity ("CBD," 1993) and its Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization ("Nagoya Protocol," 2014), and the International Treaty on Plant Genetic Resources for Food and Agriculture ("Plant Treaty," 2004).

Like the TRIPS Agreement and the UPOV Convention, the Convention on Biological Diversity, the Nagoya Protocol, and the Plant Treaty also impose important international obligations to which many national governments are legally bound. Thus, for many countries it has become critical to understand how the requirements related to creating intellectual property laws for plants that are contained in the TRIPS Agreement – and in many cases, the UPOV Convention – may be reconciled with the commitments undertaken through membership in the CBD, the Nagoya Protocol, or the Plant Treaty. The final section of Chapters 2 and Chapter 5 will elaborate potential policy solutions to this quandary. However, it will first be necessary to explore the nature of the international obligations beyond the TRIPS Agreement and the UPOV Convention that relate to the regulation of plants as intellectual property.

1.4. International Obligations beyond TRIPS and UPOV

As the rationality of intellectual property was increasingly extended to plants beginning in the 1980s, efforts to counter the perceived effects of this phenomenon developed in parallel. One of the first coordinated international efforts in this space crystallised in the form of a 1983 resolution of the Food and Agricultural Organization of the United Nations to adopt an International Undertaking on Plant Genetic Resources. The objective of this initiative was to "ensure that plant genetic resources of economic and/or social interest, particularly for agriculture, will be explored, preserved, evaluated and made available for plant breeding and scientific purposes."[153]

[153] Food and Agriculture Organization of the United Nations. (1983). *International Undertaking on Plant Genetic Resources*. Resolution 8/83, Art. 1.

One of the most significant aspects of the International Undertaking was its recognition of the "universally accepted principle that plant genetic resources are the heritage of mankind and consequently should be available without restriction."[154] The reaffirmation that plant genetic resources should be treated as common heritage may be understood as a coordinated, institutionalised response to the changes that occurred throughout the twentieth century surrounding the governance of these resources.[155] As described above, new scientific technologies developed especially in the 1970s and 1980s began to enable firms to derive greater value from plant genetic resources, a situation that was further enhanced by the broad expansion of the logic of plant breeders' rights and its associated policies and practices. At the time of its adoption, the International Undertaking was intended to act as a counterweight to this trend towards the privatisation of planting material. The resolution controversially declared that signatory governments must make plant genetic resources available "free of charge" for the purposes of scientific research, plant breeding, or genetic resource conservation.[156]

In practice, the International Undertaking's commitment to the common heritage approach to the governance of plant genetic resources proved difficult to implement. As soon as the initiative was adopted, eight industrialised countries officially lodged reservations to its contents.[157] The disquiet that representatives of these governments expressed centred on how the terms of the International Undertaking related to the free availability of plant genetic resources might affect the proprietary rights of plant breeders.

The discrepancy was clarified in 1989, at which point the Food and Agricultural Organization Conference adopted an Agreed Interpretation of the International Undertaking. The compromise that the Agreed Interpretation recognised was that plant genetic resources would remain the common heritage of humankind, but that "plant breeders' rights as provided for under UPOV…are not incompatible with the

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[154] *Id*.
[155] Raustiala, K. & Victor, D. G. (2004). The Regime Complex for Plant Genetic Resources. *International Organization, 58*(2004), 277-309.
[156] International Undertaking, *supra* note 153 at Art. 5.
[157] These eight countries were Canada, France, Germany, Japan, New Zealand, Switzerland, the United Kingdom, and the United States of America. Ten Kate, K. & Lasén Diaz, C. (1997). The Undertaking Revisited: A Commentary on the Revision of the International Undertaking on Plant Genetic Resources for Food and Agriculture. *Review of European Community & International Environmental Law, 6*(3), 284-292, 285.

International Undertaking."[158] Thus, countries that adhered to the International Undertaking "may impose only such minimum restrictions on the free exchange" of plant genetic materials "as are necessary for it to conform to its national and international obligations."[159] This language effectively rendered the International Undertaking as subordinate to national-level intellectual property laws, as well as to the UPOV Convention. The Agreed Interpretation also explained that "the term 'free access' does not mean free of charge."[160]

The notion that plant genetic resources are the heritage of humankind and consequently should be available without restriction was further limited in 1991 when the Food and Agricultural Organization Conference again amended the International Undertaking. The new Annex 3 endorsed the idea that nations have sovereign rights over their plant genetic resources.[161] This principle of national sovereignty over the plant genetic resources located within the borders of particular countries laid the foundation for one of the most significant multilateral treaties of the latter part of the twentieth century, namely the Convention on Biological Diversity, which entered into force in 1993. A diagram of the different approaches that international instruments have taken to the allocation of ownership rights over plant genetic resources is provided in Table 7.

Table 7: Approaches to Ownership of Plant Genetic Resources[162]

Mechanism for Allocating Benefits	**Ownership Approach**		
	Common Heritage	**Property rights**	
		Sovereign (state-controlled)	**Private/ Community**
Market-Based	Customary System		*TRIPS Agreement*

[158] Food and Agriculture Organization of the United Nations. (1989). *International Undertaking on Plant Genetic Resources*. Resolution 4/89, Annex 1, ¶1.
[159] *Id*. at ¶2.
[160] *Id*. at ¶5.
[161] Food and Agriculture Organization of the United Nations. (1989). *International Undertaking on Plant Genetic Resources*. Resolution 3/91, Annex 3, ¶1.
[162] This table has been adapted from Raustiala & Victor, *supra* note 155 at 285.

			UPOV Convention
Regulated	1983 *International Undertaking* *Plant Treaty* (for the 35 staple food crops specified in the agreement)	1991 Amendment to *International Undertaking* *CBD* *Plant Treaty* (public domain, not on list of the 35 crops)	*Plant Treaty* (improved plants, not in public domain)

The Convention on Biological Diversity formally originated in 1988 when the United Nations Environment Programme convened an Ad Hoc Working Group to explore the possibility of creating a binding legal instrument that would elaborate terms related to the conservation and sustainable use of biological diversity. In its final form, the CBD reaffirms and expands the principle articulated in Annex 3 of the International Undertaking, namely that States have sovereign rights over their own biological resources.[163] Furthermore, this Convention recognises three essential objectives, which are: (1) the conservation of biological diversity; (2) the sustainable use of the components thereof; and (3) the equitable sharing of benefits arising from the utilisation of genetic resources.[164]

This latter objective was intended to address one of the major criticisms that emerged in the 1980s in response to the expansion of intellectual property for plants. The critique is captured in a 1989 annex to the International Undertaking, which acknowledged that the majority of plant genetic resources used contemporarily for breeding purposes "come from developing countries, the contribution of whose farmers has not been sufficiently recognised or rewarded."[165] Furthermore, "farmers, especially those in developing countries, should benefit fully from the improved and increased use of the natural resources they have preserved."[166] Against this backdrop,

[163] Convention on Biological Diversity. (1992). *Preamble*.
[164] *Id*. at Article 1.
[165] Food and Agriculture Organization of the United Nations. (1989). *International Undertaking on Plant Genetic Resources*. Resolution 5/89, Annex 2, ¶b.
[166] *Id*. at ¶c.

the Convention on Biological Diversity recognises that individual countries have the authority to set the conditions based upon which their genetic resources may be accessed. However, the CBD also stipulates that at a minimum these should include mutually agreed terms, prior informed consent, and the fair and equitable sharing of any benefits arising from the utilisation of genetic resources.[167]

While the inclusion of access and benefit-sharing provisions in the Convention on Biological Diversity was considered a victory by advocates for the interests of plant genetic resource providers, by 2007 only 39 of the then 189 Contracting Parties had endeavoured to enact domestic legislation that would implement the CBD.[168] In response to this low level of implementation, an alliance of "Like Minded Mega-Diverse Countries" formed a working group at the World Summit on Sustainable Development in Johannesburg in 2002. During this summit, the Johannesburg Plan of Implementation was elaborated, the essential aim of which was to establish an "international regime to promote and safeguard the fair and equitable sharing of benefits arising out of the utilisation of genetic resources."[169]

Following the World Summit on Sustainable Development, the Johannesburg Plan of Implementation was considered and adapted every two years in the biannual meetings of the Conference of the Parties to the Convention on Biological Diversity. These events took place in Kuala Lumpur (2004), Curitiba (2006), and Bonn (2008), and after each conference statements were issued that invited Parties to the CBD and other relevant stakeholders to participate in the process of negotiation and elaboration of an international access and benefit sharing regime. Finally, in 2010 at its tenth meeting, the Conference of the Parties agreed to adopt the "Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization."[170]

The Nagoya Protocol requires that its Contracting Parties enact domestic laws to ensure that the prior informed consent or approval, as well as the involvement of local indigenous or traditional rural communities, is obtained for access to genetic resources where these groups have the established right to grant access to such

[167] Convention on Biological Diversity. (1992). Article 15.
[168] Buck, M. & Hamilton, C. (2011). The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity. *Review of European Community & International Environmental Law, 20*(1), 47-61, 48.
[169] Plan of Implementation of the World Summit on Sustainable Development. Article 44(o).
[170] Convention on Biological Diversity. (2010). COP 10 Decision X/1.

resources.[171] Pursuant to this framework, access agreements executed between providers and recipients of genetic resources must contain terms related to benefit sharing, including where proprietary rights are implicated surrounding the utilisation of the resources in question.[172] The Nagoya Protocol also recognises the importance of the traditional knowledge that is often associated with the use of plant genetic resources, and thus the Protocol includes this knowledge within the ambit of the access and benefit sharing regime.[173]

Although the Convention on Biological Diversity and the Nagoya Protocol together form an international legal basis for the recognition of the contributions of indigenous and local communities to genetic resource conservation and use, these regimes do not specifically address how farmers may access and use plant genetic resources. Beginning with the 1989 amendment to the International Undertaking, the United Nations formally recognised the contributions that farmers have made historically as stewards and developers of plant genetic resources. The International Undertaking therefore endorsed the concept of "farmers' rights," defined as a set of guarantees "arising from the past, present, and future contributions of farmers in conserving, improving, and making available plant genetic resources."[174]

In 1997 a Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture was endorsed at the FAO Conference. This framework aimed to confirm the needs and the individual and collective rights of farmers "to have non-discriminatory access to germplasm, information, technologies, financial resources and research and marketing systems necessary for them to continue to manage and improve genetic resources."[175] Furthermore, the Global Plan of Action endeavoured to promote a system for the fair and equitable sharing of benefits arising from the use of plant genetic resources for food and agriculture, which would also include the use of traditional knowledge,

[171] Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity. (2010) Article 6.
[172] *Id*.
[173] *Id*. at Article 12.
[174] Food and Agriculture Organization of the United Nations. (1989). *International Undertaking on Plant Genetic Resources*. Resolution 5/89, Annex 2, ¶d.
[175] Food and Agriculture Organization of the United Nations. (1996). *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture and the Leipzig Declaration*, Article 9.

innovations, and practices relevant to the conservation and sustainable use of these resources.

These objectives were eventually codified in the International Treaty on Plant Genetic Resources for Food and Agriculture ("Plant Treaty"), which was adopted in 2001 and entered into force in 2004. The fundamental aim of this regime is to promote the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of benefits arising out of the use thereof.[176] Furthermore, the Plant Treaty contains provisions that both recognise the contributions of farmers and aim to safeguard their interests. The regime thus obligates signatories to establish mechanisms through national legislation in their respective jurisdictions to guarantee "farmers' rights" in three specific domains.

These are (1) the protection of traditional knowledge related to plant genetic resources for food and agriculture; (2) the guarantee of equitable participation in any benefits arising from the utilisation of these resources by third parties; and (3) the right to participate in national level decision making surrounding matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.[177] The Plant Treaty also recognises the implicit right of farmers to save, use, exchange, and sell farm-saved seed and propagating material "subject to national law and as appropriate."[178] Thus, the conceptualisation of farmers' rights in the Plant Treaty contains four essential elements.[179] However, it is important to note that the "implicit right" of farmers to save, use, exchange, and sell farm-saved seed is expressly limited in the Plant Treaty, such that this guarantee may be subordinated to domestic regimes that regulate plants as intellectual property.

This limitation reveals why the governance of plant genetic resources has frequently been characterised as a "struggle" between plant breeders' rights and farmers' rights.[180] Proponents of the formalisation of the concept of farmers' rights have argued that the expansion of the subject matter of intellectual property to cover plants – especially according to the UPOV model for plant breeders' rights – hampers

[176] International Treaty on Plant Genetic Resources for Food and Agriculture. (2004) Article 1.
[177] *Id*. at Article 9.
[178] *Id*.
[179] Andersen, R. (2013). Crop Genetic Diversity and Farmers' Rights. In R. Andersen & T. Winge (eds.). *Realising Farmers' Rights to Crop Genetic Resources: Success Stories and Best Practices*. New York: Routledge.
[180] Borowiak, C. (2004). Farmers' Rights: Intellectual Property Regimes and the Struggle Over Seeds. *Politics and Society*, 32(4), 511-543.

the full realisation and implementation of the Plant Treaty. For instance, plant breeders' rights legislation – especially when styled after UPOV 1991 – may curtail farmers' ability to save, use, exchange, and sell farm-saved seed and propagating material.[181] However, it should be noted that this is only the case for the seed and propagating material of protected plant varieties. In other words, plant breeders' rights do not affect how farmers' manage other types of plant varieties, such as those which are native, local, and wild-type.

Nevertheless, the UPOV Convention has been criticised for other reasons, including its lack of recognition of traditional knowledge protections and access and benefit sharing provisions. Detractors contend that another fault of the Convention is that it does not advance farmers' participation in decision making surrounding the governance of plant genetic resources as intellectual property.[182] In response, the UPOV leadership has defended the Convention, by repeatedly reaffirming that the UPOV system is only concerned with new, distinct, uniform, and stable plant varieties that are protected with plant breeders' rights. Moreover, UPOV representatives have reminded critics that farmers are not required to grow protected varieties and they have also contended that UPOV does not affect the advancement of farmers' rights as enshrined in other legal regimes.[183]

The uncertainty over how States can honour multiple, sometimes competing international obligations related to the governance of different kinds of plants has become increasingly acute. This is because in recent years countries have become bound not only to the TRIPS Agreement and the UPOV Convention, but also to the CBD, the Nagoya Protocol, and the Plant Treaty. For its part, as of 2018 the Convention on Biological Diversity had 196 parties. The United States remained the only country that was not a member of the CBD. Meanwhile, the Plant Treaty had 144 parties in 2018, while the Nagoya Protocol had 105. These numbers indicate that for many countries, multiple sometimes overlapping, sometimes diverging interests and obligations are important to consider when designing systems for the regulation of

[181] De Jonge, B. (2016). *Reconciling Farmers' and Plant Breeders' Rights*. The Hague: Oxfam International.
[182] *Id*.
[183] Button, P. (2016). Overview of the UPOV Convention. Proceedings of the Symposium on Possible Interrelations between the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) and the International Convention for the Protection of New Varieties of Plants (UPOV Convention). Geneva, 26 October 2016.

plants as intellectual property. A list of countries that are bound to the UPOV Convention and that also have obligations under the CBD, the Nagoya Protocol, and/or the Plant Treaty is displayed in Table 8.

Table 8: Countries Bound to UPOV with Additional Obligations

Country	UPOV Version	CBD	Nagoya Protocol	Plant Treaty
Albania	UPOV 1991	X	X	X
Argentina	UPOV 1978	X	X	X
Australia	UPOV 1991	X		X
Austria	UPOV 1991	X		X
Azerbaijan	UPOV 1991	X		
Belarus	UPOV 1991	X	X	
Belgium	UPOV 1991	X	X	X
Bolivia	UPOV 1978	X	X	X
Bosnia and Herzegovina	UPOV 1991	X		
Botswana	UPOV 1991	X	X	
Brazil	UPOV 1978	X		X
Bulgaria	UPOV 1991	X	X	X
Canada	UPOV 1991	X		X
Chile	UPOV 1978	X		X
China	UPOV 1978	X	X	
Colombia	UPOV 1978	X		X
Costa Rica	UPOV 1991	X		X
Croatia	UPOV 1991	X	X	X
Cyprus	UPOV 1991	X		X
Czech Republic	UPOV 1991	X	X	X
Denmark	UPOV 1991	X	X	X
Dominican Republic	UPOV 1991	X	X	X
Ecuador	UPOV 1978	X	X	X
Estonia	UPOV 1991	X		X
Finland	UPOV 1991	X	X	X
France	UPOV 1991	X	X	X
The Gambia	UPOV 1991	X	X	
Georgia	UPOV 1991	X		
Germany	UPOV 1991	X	X	X
Ghana	UPOV 1991	X		X
Greece	UPOV 1991	X		X
Hungary	UPOV 1991	X	X	X
Iceland	UPOV 1991	X		X
Ireland	UPOV 1991	X		
Israel	UPOV 1991	X		
Italy	UPOV 1991	X		X
Japan	UPOV 1991	X	X	X
Jordan	UPOV 1991	X	X	X
Kenya	UPOV 1991	X	X	X
Kyrgyzstan	UPOV 1991	X	X	X
Latvia	UPOV 1991	X		X
Lesotho	UPOV 1991	X	X	X
Liberia	UPOV 1991	X	X	X
Lithuania	UPOV 1991	X		X

Country	UPOV Version	CBD	Nagoya Protocol	Plant Treaty
Luxembourg	UPOV 1991	X	X	X
Malawi	UPOV 1991	X	X	X
Malta	UPOV 1991	X	X	X
Mexico	UPOV 1978	X	X	
Montenegro	UPOV 1991	X		X
Morocco	UPOV 1991	X		X
Mozambique	UPOV 1991	X	X	
Namibia	UPOV 1991	X	X	X
Netherlands	UPOV 1991	X	X	X
New Zealand	UPOV 1978	X		
Nicaragua	UPOV 1978	X		X
Norway	UPOV 1978	X	X	X
Oman	UPOV 1991	X		X
Panama	UPOV 1991	X	X	X
Paraguay	UPOV 1978	X		X
Peru	UPOV 1991	X	X	X
Poland	UPOV 1991	X		X
Portugal	UPOV 1991	X	X	X
Republic of Korea	UPOV 1991	X	X	X
Republic of Moldova	UPOV 1991	X	X	X
Romania	UPOV 1991	X		X
Russian Federation	UPOV 1991	X		
Rwanda	UPOV 1991	X	X	X
São Tomé and Príncipe	UPOV 1991	X	X	X
Serbia	UPOV 1991	X		X
Sierra Leone	UPOV 1991	X	X	X
Singapore	UPOV 1991	X		
Slovakia	UPOV 1991	X	X	X
Slovenia	UPOV 1991	X		X
Somalia	UPOV 1991	X		
South Africa	UPOV 1978	X	X	
Spain	UPOV 1991	X	X	X
Sudan	UPOV 1991	X	X	X
Swaziland	UPOV 1991	X	X	
Sweden	UPOV 1991	X	X	X
Switzerland	UPOV 1991	X	X	X
The former Yugoslav Republic of Macedonia	UPOV 1991	X		X
Trinidad and Tobago	UPOV 1978	X		X
Tunisia	UPOV 1991	X		X
Turkey	UPOV 1991	X		X
Uganda	UPOV 1991	X	X	X
Ukraine	UPOV 1991	X		
United Kingdom	UPOV 1991	X	X	X
United Republic of Tanzania	UPOV 1991	X	X	X
United States of America	UPOV 1991			X

Country	UPOV Version	CBD	Nagoya Protocol	Plant Treaty
Uruguay	UPOV 1978	X	X	X
Viet Nam	UPOV 1991	X	X	
Zambia	UPOV 1991	X	X	X
Zimbabwe	UPOV 1991	X	X	X

As Table 8 shows, Ecuador – which is the focus of the case study developed in Part 2 of this thesis – is legally bound by the TRIPS Agreement and the 1978 version of the UPOV Convention, in addition to the possible future obligation to adhere to UPOV 1991 as mandated under the terms of the 2016 free trade agreement with the European Union. Meanwhile, Ecuador also ratified the Convention on Biological Diversity in 1993, acceded to the Plant Treaty in 2004, and ratified the Nagoya Protocol in 2017. As a result, Ecuador must balance a variety of international and national interests when establishing a national system of intellectual property for plants. For many other countries, the situation is analogous.

Given the various formal legal obligations that many States have undertaken related to the governance of different types of plants, it is necessary to explore the various approaches that countries could take to regulate plants as intellectual property. Chapter 2 considers a series of "conventional" approaches to intellectual property for plants. This designation is derived from the language of Article 27.3(b) of the TRIPS Agreement, which requires that countries offer a form of intellectual property for plant varieties, either via a system of patents, a *sui generis* regime, or some combination of both.

It should be noted that given the extent to which the UPOV Convention model of plant breeders' rights has shaped intellectual property imaginaries, it may be unlikely that many governments would consider these conventional approaches. Nevertheless, they may be informative both to legally unbound countries – which have no formal obligation to implement a system based on the UPOV Convention – and legally bound countries. An understanding of these conventional approaches may provide inspiration for the imagination of truly innovative intellectual property laws for plants, which could alternately import and depart from conventional rationalities.

Chapter 2. Conventional Approaches to Intellectual Property for Plants

As Chapter 1 of this thesis has illustrated, a large number of countries are legally bound to a variety of international instruments, which limit how the access to and use of different types of plants can be regulated. As States accede to one or more of the treaty regimes described in the previous chapter, the overarching question for national governments becomes, is it possible *not* to use a particular system – or a part thereof – to regulate certain uses of plants? This question is particularly salient in relation to the regulation of plants as intellectual property. This is because one of the frameworks introduced in Chapter 1 – namely, the UPOV Convention – mandates a specific model for how plants should constitute protectable subject matter, namely the prototype of plant breeders' rights.

In order to understand the lawmaking options that are available in a given territory, it is useful to return to the typology of countries elaborated in Chapter 1. Foremost, it is notable that States classified as legally unbound – that is, having no obligations under the TRIPS Agreement or the UPOV Convention – may choose any of the options delineated in the third section of Chapter 2 and in Chapter 5 of this thesis. Furthermore, legally unbound countries may also elect not to regulate plants as intellectual property at all. Even if such an approach were taken, a nation that is legally unbound could still decide to develop laws for the governance of different types of plants outside of the realm of what is conventionally understood to be intellectual property. For instance, these countries could enact legislation related to access and benefit sharing pursuant to the Convention on Biological Diversity or the Nagoya Protocol; frameworks to establish standards for seed quality control; policies related to the conservation of agrobiodiversity; regimes designed to safeguard traditional knowledge related to plants, or laws designed to ensure food security or food sovereignty.

In contrast to legally unbound countries, the formal policy space in which legally bound countries must operate is significantly more limited. For members of the World Trade Organization not classified as least developed countries, the TRIPS Agreement outlines the essential minimum standards of intellectual property for plants. If a given country is obligated to adhere to TRIPS but has not assumed any additional commitments under the UPOV Convention, it may choose either Alternative 1 or Alternative 2, as elaborated in the first and second sections of Chapter 2, respectively.

That is, these governments may choose either to conceive of plant varieties as patentable subject matter, or to enact a *sui generis* intellectual property law for plants.

Meanwhile, countries that are signatories to the UPOV Convention – whether they joined independently or as the result of an obligation mandated by the terms of a free trade agreement – have a more limited set of options. Specifically, countries that are legally bound to the 1978 version of the UPOV Convention may only choose Alternative 2, and the *sui generis* system that they implement must conform to UPOV 1978. In contrast, countries that are members of the 1991 version of the UPOV Convention may decide either to follow only Alternative 2 – by enacting a UPOV 1991 based plant breeders' rights regime – or to select both Alternative 1 and Alternative 2. This is because UPOV 1991 allows for plant varieties that are protected with plant breeders' rights to also be patented.

In addition to the obligations that countries may have under the TRIPS Agreement or the UPOV Convention, many States have also taken on commitments under the Convention on Biological Diversity, the Nagoya Protocol, and the Plant Treaty. Regardless of whether a country is classified as legally unbound or legally bound in relation to the provision of intellectual property laws for plants, it may have other legal obligations in relation to how national laws should regulate the usage of different types of plants. The final section of Chapter 2 and Chapter 5 of the thesis will develop a set of options that national governments could follow to actualise the terms of the CBD, the Nagoya Protocol, and the Plant Treaty, irrespective of whether their countries are categorised as legally bound or legally unbound. Meanwhile, the first two sections of the present chapter elaborate a set of options that domestic policymakers could consider as conventional approaches to legislate intellectual property for plants.

2.1. Alternative 1: Patents

Article 27 of the TRIPS Agreement sets out general minimum standards that World Trade Organization Member States must meet in their respective national patent regimes. The international baseline for patent protection was expanded substantially under TRIPS, in that the Agreement mandates that "patents shall be available for any inventions, whether products or processes, in all fields of

technology."[184] This provision represented a significant change for many countries. At the time of the Uruguay Round negotiations during which the TRIPS Agreement was drafted, nearly fifty countries did not confer patent protection for inventions of any kind in certain fields, such as pharmaceuticals, biotechnology, and food.[185] As a result of differences between the patent systems of developed and developing countries at the time when the Agreement was finalised, and because of the implications associated with extending patent protection to both products and processes in all technology fields, the patentability criteria proved to be one of the most difficult parts of TRIPS to negotiate.[186]

Despite the fact that TRIPS states that patents must be available for inventions in all fields of technology, the Agreement allows signatories to exclude from patent protection plants and animals other than microorganisms, and essentially biological processes for the production of plants and animals.[187] The rationale for this exclusion may be traced to the widespread uncertainty that surrounded new developments in the field of biotechnology at the time of the Uruguay Round negotiations.[188] In 1994, many World Trade Organization Member States were unsure how to treat biological inventions, and jurisprudence was evolving rapidly and unpredictably, even in the few territories that at the time allowed for patents that claimed plant varieties to be granted.[189] Thus, it was agreed that plants should constitute the subject matter of intellectual property, but the mechanism through which such protection should be instantiated was left undefined.

Due to the open nature of the language in the TRIPS Agreement in relation to the regulation of plants as intellectual property, it is important to explore the policy space that is available for each of the two general alternatives: patents and *sui generis* regimes. For more than two decades, scholarship has focused on the formal policy space that TRIPS offers World Trade Organization Member States to design patent

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[184] TRIPS Agreement, Article 27.1.
[185] Correa, C. M. (2007). *Trade Related Aspects of Intellectual Property Rights: A Commentary on the TRIPS Agreement.* Oxford, UK: Oxford University Press. pp. 271.
[186] Gervais, D. (2008). *The TRIPS Agreement: Drafting History and Analysis* (3rd Edition). United Kingdom: Thomson Reuters, pp. 336.
[187] TRIPS Agreement, Art. 27.3(b).
[188] De Carvalho, N. P. (2010). *The TRIPS Regime of Patent Rights* (3rd Edition). The Netherlands: Kluwer Law International.
[189] For instance, even in the United States – the first country to expressly allow for patents to be granted over living organisms – the patentability of plant varieties was a contested issue. It was not until 2001 that the United States Supreme Court expressly clarified that utility patents may be issued for plant varieties. *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.*, 534 U.S. 124 (2001).

laws that would respond to the needs of developing countries to protect public health and enhance access to medicines.[190] However, few analyses have focused on the use of the formal policy space available in the TRIPS Agreement to create locally adapted patent laws for plants.

Indeed, patents have been frequently dismissed as a means to meet the TRIPS requirement to provide a form of intellectual property protection for plant varieties. As one prominent expert has noted, "though the patentability of plant varieties is a possible option, it provides a more restrictive framework than the breeders' rights regime."[191] However, it is important to recognise that the TRIPS Agreement does not compel governments to adopt any particular form of patent protection. This means that World Trade Organization Member States have "the option of including plant varieties within existing utility patent statutes and/or of enacting a separate statute applicable exclusively to plants."[192] As explained in Chapter 1 of this thesis, there is precedent for the latter type of framework. Although the United States remains the only country in the world to have enacted a dedicated plant patent law, other territories could consider designing similar regimes to meet their obligations under TRIPS Article 27.3(b).

Plant Patents

It may be tempting to dismiss the United States 1930 Plant Patent Act as irrelevant, as a relic of a past era with little bearing on modern agricultural science. The 1930 Plant Patent Act was passed nearly half a century before the emergence of biotechnological techniques for plant breeding such as molecular marker based trait selection, genetic modification, and genetic engineering. However, the plant patent system is still actively utilised today, even though the United States also offers two additional forms of intellectual property protection for plants.[193] In fact, in recent years, plant patents have proven to be the most prevalent of the three forms of intellectual property available for plants in the United States, and the popularity of this regime has

[190] *See, e.g.,* Correa, C. M. (2002). Implications of the Doha Declaration on the TRIPS Agreement and Public Health. *World Health Organization*.
[191] Correa, C. M. (2000) *Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options.* London, UK: Zed Books, pp. 68.
[192] Helfer, *supra* note 54 at 42-43.
[193] These are utility patents and plant variety protection via the Plant Variety Protection Act of 1970 (7 U.S.C. §§ 2321-2582).

increased even after utility patents began to be granted for sexually reproducing plant species in that country in the 1980s.[194]

Although the United States Plant Patent Act of 1930 represented the first formal system of intellectual property for plants in the world – and despite the continued utility of this framework today – plant patents have not generally been taken seriously as a possible means for countries to meet the requirements mandated under TRIPS Article 27.3(b).[195] However, several reasons exist for why this option should not be dismissed outright. For instance, while utility patents were developed to protect inanimate articles of manufacture, systems granting plant-specific patents could be adapted to ensure that the form of protection is appropriately tailored of the realities of biological reproduction. Thus, governments could explicitly contemplate how to answer the question: where do natural processes end and invention begin?[196]

The United States Plant Patent Act represents an early example of lawmakers grappling to understand and legislate the concept of invention when the product of the creative process is a new type of plant. Such inquiries are ongoing today, as recent developments in the laws of territories such as the European Union have illustrated.[197] For its part, "[t]he Plant Patent Act of 1930 extended patents to plants, but it did so only by analogy, establishing a species of patent right that addressed plant inventions as exceptions or approximations to mechanical or chemical inventions."[198] Thus, in contrast to utility patents, the American plant patent system acknowledged that nature, not just human inventors, plays a key role in plant breeding.[199]

This recognition resulted in a form of protection grounded in the precedent set by utility patents, but whose parameters were redesigned to accommodate the biological nature of plants. A specific example of this phenomenon is apparent in how

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[194] Pardey, P. G., Koo, B., Drew, J., Horwich, J., & Nottenburg, C. (2013). The Evolving Landscape of Plant Varietal Rights in the United States, 1930-2008. *Nature Biotechnology, 31*(1), 25-29.
[195] One exception to this trend is seen in Helfer, *supra* note 54, although the discussion in this publication surrounding the possibility of meeting the obligations under TRIPS Article 27.3(b) is limited to one paragraph.
[196] This query is treated extensively in the analysis of the United States Plant Patent Act realised in Pottage & Sherman, *supra* note 18.
[197] In June 2017, the Administrative Council of the European Patent Office decided to amend its examination regulations to exclude from patentability plants and animals exclusively obtained by an essentially biological breeding process, under the theory that such means of plant breeding are not sufficiently inventive. European Patent Office, Guidelines for Examination. Part G, Chapter II, section 5.4.2. *Retrieved from* http://www.epo.org/law-practice/legal-texts/html/guidelines/e/g_ii_5_4_2.htm (accessed 3 October 2017).
[198] Pottage & Sherman, *supra* note 18 at 543.
[199] *Id*. at 558.

the Plant Patent Act altered the criteria for protection as intellectual property. Most notable among these modifications is the revised disclosure requirement contained in the Plant Patent Act. While the United States utility patent regime required that an invention be described sufficiently well to enable a person skilled in the relevant "art" to reproduce it, the Plant Patent Act rendered this requirement significantly less rigorous.[200]

The result of relaxing the disclosure requirement was that "'intellectual possession,' or the ability to provide a recipe for the fabrication of the artefact, mattered less than the physical possession of the biological 'means of production.'"[201] In other words, while the history of modern patent law has been characterised by distinguishing between ideas and embodiments – or between the invention and the material artefact in which it is expressed[202] – the United States plant patent system does not operate to disembody inventions from their tangible representations. Thus, the inquiry for plant patent protection was "not whether inventors could provide an enabling description but whether they could 'identify and use the [invention] in the manner described in the patent.'"[203] In the current iteration of the Plant Patent Act, the pragmatic effect of this provision is that plant patents may not be declared invalid for noncompliance with the disclosure requirement as long as the description is "as complete as is reasonably possible."[204]

In addition to the changes to the disclosure requirement, the United States Plant Patent Act also created a new criterion for patentability – distinctness. That is, plant patents were made available to anyone who "invents or discovers and asexually reproduces any distinct and new variety of plant."[205] The law does not define the meaning of distinctness for the purposes of evaluating applications for plant patents.[206] It only requires that the applicant describe the invention, in a single claim, which *may* also recite the principal distinguishing characteristics of the claimed plant.[207] Meanwhile, the specification of the plant patent application must contain a "complete

[200] Fowler, *supra* note 16.
[201] Pottage and Sherman, *supra* note 18 at 566.
[202] Pottage, A. & Sherman, B. (2000). *Figures of Invention: A History of Modern Patent Law*. Oxford, UK: Oxford University Press, pp. 1.
[203] *Id*. at 567.
[204] 35 U.S. Code § 162.
[205] 35 U.S. Code § 161.
[206] Fowler, *supra* note 16.
[207] 37 U.S. Code of Federal Regulations 1.164.

detailed description of the plant and the characteristics thereof" that distinguish it from "other related known varieties."[208] These distinguishing features do not need to be quantified, and there is no required number of distinct characteristics for a plant to be patentable.

Subsequent to the enactment of the United States Plant Patent Act, the system that was codified in the 1961 UPOV Convention reinscribed the distinctness criterion as one of the key requirements for the grant of plant breeders' rights. Additionally, the UPOV system requires that new varieties of plants be genetically uniform and stable in order for protection to be awarded. These conditions are notably absent from the United States Plant Patent Act. Therefore, plant patents could potentially offer a viable mechanism for the protection of new, yet relatively heterogeneous types of plants. Some measure of genetic variability is common in agricultural plants that have been developed in customary or informal settings, such as those that farmers improve through the practices of trait identification, selection, and crossing.[209] By omitting the criteria of uniformity and stability, a locally adapted plant patent framework could enable countries to offer a form of intellectual property for different types of plants, thereby departing from the plant breeders' rights model.

There are certain other reasons for why plant patents could represent an attractive option for countries to balance the interests of diverse national stakeholders while still providing a form of intellectual property for plants. For instance, in the United States plant patents have a duration of twenty years from the date of filing of the application.[210] This is also the minimum period of protection mandated under the 1991 version of the UPOV Convention for most plant genera and species, though the term of the breeder's right under this latter system is longer – at twenty-five years minimum – for trees and vines.[211] Furthermore, given that *sui generis* plant patent regimes are not bound to minimum periods of protection as are plant breeders' rights laws modelled on the UPOV Convention, countries could use this option to establish different durations of exclusivity for different types of plants.

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[208] *Id*.
[209] Cleveland, D. A. & Soleri, D. (2007). Extending Darwin's Analogy: Bridging Differences in Concepts of Selection between Farmers, Biologists, and Plant Breeders. *Economic Botany, 61*(2), 121-136.
[210] 35 U.S. Code §163. Note that plant patents issued before 7 June 1995 had a duration of 17 years from the date of grant. United States 12 Stat. 246.
[211] UPOV 1991, Art. 19.

Likewise, the scope of protection that plant patents grant in the United States is narrower in some respects than the rights conferred under the UPOV framework. For example, the Plant Patent Act was designed to protect the plant only, not its fruit or flowers; in other words, the law was intended to cover the plant only as "an instrument of reproduction."[212] In contrast, plant breeders' rights as provided in laws modelled on UPOV 1991 must extend to harvested material, including entire plants and parts of plants that are obtained through the unauthorised use of propagating material of the protected variety.[213] Thus, laws that would grant plant patents similar to those available in the United States may be better able than the UPOV Convention to ensure that exclusive proprietary rights do not unduly encumber broad access to food.

Indeed, the legislative history of the Plant Patent Act – enacted soon after the onset of the Great Depression in the United States – suggests that the monopolisation of food was inapposite to the intention that gave rise to the law.[214] The reluctance to allow patents that would cover food products has been cited as one of the principal rationales behind the most significant aspect of the Plant Patent Act: that it only applies to asexually (i.e., vegetatively) reproducing plants, and that it excludes tubers from protection. The majority of staple food crops are either sexually reproducing cereal grains (e.g., rice, maize, wheat, millet, sorghum) or tubers (e.g., potatoes, sweet potatoes, cassava, yams). In contrast to the Plant Patent Act, UPOV 1991 envisages a form of intellectual property for plants that extends to all botanical genera and species.[215]

One final area of significant difference between the plant patent system in the United States and the UPOV Convention framework relates to how these regimes conceptualise infringement. Under the original 1930 Plant Patent Act, for infringement to occur, it was necessary for the right holder to demonstrate that there had been an actual, physical appropriation of the patented plant.[216] In the current version of the Act, the scope of protection includes the right to exclude others from asexually reproducing the plant, and from using, offering for sale, or selling the plant so reproduced, or any

[212] Fowler, *supra* note 16 at 642.
[213] UPOV 1991, Art. 14(2).
[214] *See* Fowler, *supra* note 16 at 642.
[215] UPOV 1991, Art. 3.
[216] Pottage and Sherman, *supra* note 18 at 550.

of its parts, or from importing the plant so reproduced.[217] However, as the United States Federal Circuit court clarified in 1995, the independent derivation of a protected plant variety still does not constitute infringement, provided that no physical appropriation has occurred.[218]

The scope of plant breeders' rights under UPOV 1991 is broader than the rights provided by the U.S. Plant Patent Act, in that the UPOV Convention also grants the right to prevent third parties from conditioning protected varieties for the purposes of propagation, exporting, and stocking protected varieties for commercial purposes.[219] Additionally, according to UPOV 1991 the breeder enjoys the same set of rights for plant varieties that are essentially derived from the protected variety, varieties that are not clearly distinguishable from the protected variety, and varieties whose production requires the repeated use of the protected variety.[220]

However, although the rights granted under the UPOV system are arguably more expansive than those associated with plant patents in the United States, the UPOV Convention also recognises several limitations to the breeder's right that are not found in the Plant Patent Act. These include exceptions for acts done privately and for non-commercial purposes; acts done for experimental purposes; acts done for the purpose of breeding other varieties; and the saving and re-planting of protected varieties by farmers on their own holdings.[221] While the United States plant patent system does not contain these exceptions, *sui generis* plant patent laws in other countries could recognise them in accordance with local legislative priorities.

Due to the limitations of the scope of protection to asexually reproducing plants, the United States Plant Patent Act has predominantly been used to obtain rights over ornamental plants and fruit crops.[222] Nevertheless, other countries could experiment with similar systems to grant a specialised patent that would cover all genera and species of plants regardless of their type of reproductive biology, thereby complying with the requirements of TRIPS Article 27.3(b). Such a framework could offer certain advantages over both UPOV based systems for plant breeders' rights and utility

[217] 35 U.S. Code § 163.
[218] *Imazio Nursery, Inc. v. Dania Greenhouses*, 69 F.3d 1560 (Fed. Cir. 1995). *See also* Kjeldgaard, R. H. & Marsh, D. R. (1996). Recent United States Developments in Plant Patents. *Molecular Breeding, 2*, 95-96.
[219] UPOV 1991, Art. 14(1)(a).
[220] UPOV 1991, Art. 14(5)(a).
[221] UPOV 1991, Art. 15.
[222] Pardey et al., *supra* note 194.

patents. For instance, unlike UPOV, plant patents could be granted based on the criteria of novelty, distinctness, and sufficient disclosure. At the same time, the disclosure requirement could be relaxed in comparison to utility patents, such that applicants would only need to provide a description of the plant that is "as complete as is reasonably possible" instead of being required to enable others to reproduce the invention. This kind of law could encourage a greater diversity of actors to protect the plant varieties that they develop, due to the absence of uniformity and stability as criteria for protection.

Given that to date, a specialised regime to grant plant patents has only been implemented in one country, it is difficult to evaluate how such a framework would operate in territories outside of the United States. In the modern landscape of intellectual property legislation, the Plant Patent Act is an anomaly. Plant patents are not quite utility patents, not quite plant breeders' rights, and significant confusion has surrounded the nature of this form of intellectual property.[223] Yet, legally unbound countries and States that are bound only to the TRIPS Agreement could still consider plant patents as a means to regulate plants as intellectual property.

Plant patents could fall into either of the two alternative forms of plant variety protection that are mandated under TRIPS Article 27.3(b). Conceptualised as a *sui generis* regime, plant patents could build on the example established by the United States Plant Patent Act by incorporating certain protections or exceptions for parties other than plant breeders, such as scientific researchers, farmers, and consumers of food. On the other hand, if conceived simply as patents, then a plant patent regime could take advantage of the formal policy space that remains available in the TRIPS Agreement surrounding the form that national utility patent legislation may take. Notwithstanding the various minimum standards that the TRIPS Agreement institutes, the extent and nature of the space within which to design laws granting utility patents remains relatively broad, as will be discussed in the following section.

[223] For instance, it has even been argued that plant patents are actually a form of copyright. Bernstein, D. B. (1986). Is a Plant Patent a Form of Copyright? *IDEA: The Journal of Law and Technology, 27*(1), 31-38.

Utility Patents

Although the TRIPS Agreement mandates that countries which are legally bound to meet its minimum requirements may utilise patents as a means to establish intellectual property for plants, few governments have elected to do so. Instead, most States have opted to follow the UPOV Convention model of plant breeders' rights, either wholly or in part. Due to this trend, as well as to the fact that scholars have generally rejected patents as a desirable form of intellectual property for plants, the literature has largely ignored this option. Nevertheless, it is worth exploring the nature of the formal policy space available under the TRIPS Agreement for the purposes of establishing intellectual property for plants.

It has been argued that there are three major sources of flexibility that allow utility patent laws to be adapted to local needs while still remaining compliant with the TRIPS Agreement. The three areas in which this policy space is located relate to (1) undefined terms in the Agreement, (2) general limitations to the rights granted to patent holders, and (3) specific exceptions to the exclusivity granted.[224] While some standards under TRIPS are rigid – for instance, the term of patent protection may not be less than twenty years from the date of filing[225] – many important utility patent provisions may be adapted according to national policy priorities, economic development paradigms, and the interests of local stakeholders.

Definitional Flexibilities

The first major source of formal policy space within utility patent systems relates to the terms or criteria that are either undefined or vague in the text of the TRIPS Agreement. For instance, some ambiguity exists in relation to the definition of patentable subject matter. As discussed above, TRIPS Article 27.1 requires that patents must be available for any inventions, whether products or processes, in all fields of technology, provided that they meet the specific requirements for patentability that TRIPS also establishes. However, the Agreement expressly enumerates certain subject matter that may be excluded from protection in national utility patent laws.

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[224] Shadlen, K. (2005). *Policy Space for Development in the WTO and Beyond: The Case of Intellectual Property Rights*. Global Development and Environment Institute Working Paper No. 05-06. Tufts University.
[225] TRIPS Agreement, Article 33.

Foremost, countries that are legally bound to the TRIPS Agreement may exclude certain inventions from patentability when doing so is necessary to protect *ordre public* or morality, including to safeguard human, animal, or plant life or health or to avoid serious prejudice to the environment.[226] However, the criteria for determining whether an invention would jeopardise *ordre public* or morality are not elaborated. Instead, these concepts are left undefined, to be described based on local conceptualisations.

The TRIPS Agreement also explicitly permits World Trade Organization Member States to exclude specific categories of inventions from patentability. One category of inventions that are able to be excluded includes plants and animals – other than microorganisms – and essentially biological processes for the production of plants or animals, other than non-biological and microbiological processes.[227] As mentioned earlier, the fact that TRIPS allows countries to exclude plants and essentially biological processes for the creation of plants from patent protection grew out of the uncertainties surrounding the rapid development of new biotechnological techniques at the time when the Agreement was signed. The nature of this flexibility means that countries that are only legally bound to the TRIPS Agreement may elect to allow only plants but not essentially biological methods to be patented, or vice versa.

In addition to the formal policy space that exists in relation to the definition of patentable subject matter, the TRIPS Agreement affords signatory countries space surrounding the elaboration of the requirements for patentability in their respective national frameworks. While the Agreement specifically requires that utility patents be granted based on the criteria of novelty, non-obviousness or inventive step, and utility or industrial application, a measure of latitude exists within each of these categories for local experimentation. For the purposes of utility patent protection, novelty does not mean new in the sense that the invention never previously existed. Instead, novelty requires that the invention be quantitatively different than the "prior art" – that is, the technical information disclosed by the patent must not have been previously available to the public.[228] While this definition of novelty has become common, there are

[226] TRIPS Agreement, Article 27.2.
[227] TRIPS Agreement, Article 27.3(b).
[228] Bently, L. & Sherman, B. (2014). *Intellectual Property Law*. (4th Edition). Oxford, UK: Oxford University Press, pp. 529.

significant differences in national utility patent laws in relation to how the concept of prior art is defined.[229]

In some territories – including Australia, the United States, and several Latin American countries – inventors are afforded a twelve-month grace period, such that disclosures that they make during this time are not considered to form part of the prior art for the purposes of evaluating the novelty of their inventions.[230] Other countries offer a more limited grace period. For instance, in China certain disclosures will not destroy novelty if they occurred within six months of the filing date of a patent application.[231] Another difference is that in some national utility patent laws, information contained in prior patent applications does not undermine novelty, regardless of whether or not those applications have been published.[232] This is the case in the United States and Europe. In other territories, the concept of prior art has been enlarged to also include precedents that have not been disclosed before the date of application, but which demonstrate that a third party had previously generated the same invention.[233]

If a country elected to meet the obligation established in TRIPS Article 27.3(b) by expanding utility patent protection to cover plants, the formal policy space available for the novelty requirement could be useful as a means to protect the interests of a variety of actors in the agricultural sector. For instance, if a farmer could demonstrate that he or she had previously developed the same new plant variety that is claimed in a patent application – even though information about this variety was never published – the novelty of the claimed invention might be defeated. This means of patent invalidation could operate in a manner similar to prior cases, for instance when patents granted for plants with certain useful properties were annulled following the presentation of evidence that local communities had historically utilised the same plants for the same purposes. Examples of this phenomenon include the litigation of cases involving neem, turmeric, and basmati rice.[234]

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[229] Correa, *supra* note 191 at 82.
[230] World Intellectual Property Organization. "Certain Aspects of National/Regional Patent Laws." Revised Annex II of document SCP/12/3 Rev.2. Retrieved from http://www.wipo.int/export/sites/www/scp/en/national_laws/grace_period.pdf.
[231] *Id*.
[232] Correa, *supra* note 191 at 82.
[233] *Id*.
[234] During the 1990s, a series of patents were granted in the United States and in some cases the European Patent Office related to the uses of turmeric (for use in wound healing); basmati rice (a novel method of breeding, preparing, and cooking the rice); and neem (for a variety of uses, including

Another example of a formal flexibility relates to the fact that some countries allow processes that are not novel *per se* but which use or produce a new product to meet the novelty requirement. The United States, for instance, employs this legal fiction to allow patents on secondary uses of known processes. However, developing countries could also take advantage of such a conceptualisation of novelty as a means to foster local innovation. After all, it may be easier and require fewer scientific, technological, and financial resources to identify new applications of known processes than to develop entirely new methods.[235] On the other hand, some countries have elected to exclude reformulations or secondary uses from patent protection to prevent monopoly rights from extending beyond the initial twenty-year period of protection. This is usually done as a means to ensure that important inventions – such as pharmaceuticals – are not improperly encumbered.[236]

The second essential condition that applicants for utility patents must demonstrate is the requirement of "non-obviousness" or "inventiveness." TRIPS allows countries to incorporate either concept into their national utility patent laws and remain in compliance with the Agreement.[237] However, "non-obvious" is not necessarily synonymous with "inventive," at least according to how these criteria have been defined in national utility patent laws. Generally, a non-obviousness determination is based on considerations of the scope and content of the prior art; differences between the claimed invention and the prior art; and the level of ordinary skill in the relevant art.[238] In contrast, inventiveness considers the extent to which the invention in question solves a technical problem, which may be understood as a more objective inquiry.[239]

The option to require inventiveness instead of non-obviousness as a requirement for protection in utility patent legislation provides significant latitude for countries that are legally bound to the TRIPS Agreement. Essentially, requiring that an invention be sufficiently inventive to obtain protection is a means by which countries

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as a pesticide, medicine, and fertilizer). Litigation ensued, with civil society groups claiming that "biopiracy" of local plant genetic resources and associated traditional knowledge had occurred. Ghosh, S. (2003). Globalization, Patents, and Traditional Knowledge. *Columbia Journal of Asian Law, 17*(1), 73-120.

[235] *Id*.

[236] Shadlen, *supra* note 224.

[237] Note 5 of Article 27 of the TRIPS Agreement states, "For the purposes of this Article, the terms 'inventive step' and 'capable of industrial application' may be deemed by a Member to be synonymous with the terms 'non-obvious' and 'useful' respectively."

[238] Correa, *supra* note 191.

[239] *Id*.

are able to limit the number of patent applications that their national patent offices receive, which may be desirable to ensure that resources are not wasted. Furthermore, governments can utilise the formal policy space surrounding the concept of inventiveness to ensure that patents are not granted for incremental improvements, which are the kinds of inventions that may be more easily created in places where scientific and technological resources are lacking.[240] In the context of plant breeding, a high standard of inventiveness could ensure that monopoly rights are not granted over new varieties of plants whose distinctive traits only represent minor improvements over the characteristics of extant varieties.

Several countries have experimented with different definitions of the inventiveness requirement to ensure that the patents granted within their borders meet certain minimum standards. For instance, in China, to be protected an invention must have "prominent and substantive distinguishing features and represent[] a marked improvement."[241] Likewise, in India, "inventive step" is defined as "a feature of an invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art."[242] Both of these definitions require that inventions can be quantifiably determined to be improvements over the prior art, rather than simply non-obvious.

Countries that are legally bound to the TRIPS Agreement may also elect to recognise either utility or industrial application as a requirement for patentability. Here again, TRIPS contains a formal legal space, such that World Trade Organization Member States may choose either criterion,[243] even though in practice utility and industrial application have different meanings and implications. While the former concept considers whether the invention is operable and capable of satisfying some function of benefit to humanity, the latter is more pragmatic, based on a determination

[240] Gervais, D. (2014). Patentability Criteria as TRIPS Flexibilities: The Examples of China and India. In R. L. Okediji & M. A. Bagley (eds.) *Patent Law in Global Perspective.* Oxford, UK: Oxford University Press.
[241] Patent Law of the People's Republic of China, *as revised by* Decision Regarding the Revision of Patent Law of the People's Republic of China, Art. 22, promulgated by the Standing Comm. Nat'l People's Cong., Aug. 25, 2000.
[242] The Patents (Amendment) Act of India, 2005. Section 2(ja).
[243] TRIPS Agreement, *supra* note 237.

of whether the invention can be manufactured or used in any form of industry, including agriculture.[244]

Utility may be defined as requiring evidence that the claimed invention accomplishes a socially desirable goal. In contrast, industrial applicability may be understood as stricter, because the realisation of this goal should not be merely aspirational.[245] In other words, industrial applicability may be defined pragmatically, such that national industries should be actually capable of producing the patented invention. In the agricultural context, this means that a high standard for industrial application could bar the protection of certain types of plants, for instance those which are developed through sophisticated biotechnological techniques in a country where the local industry does not have the capacities required to produce the claimed products.

As with the concept of inventiveness, countries have diversely interpreted the meaning of industrial applicability. For instance, in India an invention has "industrial applicability" if can be (1) made, (2) used in at least one field of activity, and (3) reproduced with the same characteristics as many times as necessary.[246] This definition requires not only that the invention can actually be used, but also that adequate capacity exists to reproduce it in sufficient quantities to meet national demand. If such a definition were applied to plants, it might require the existence of appropriate local capacity for multiplication of the protected variety in order to meet market demand.

Another important concept that is undefined in the TRIPS Agreement is the notion of invention itself. Throughout the history of patent law, the concept of invention has been variously defined. Some conceptualisations have focused on subjective evaluations of who the inventor is or on the activity that inventors perform. Other renditions of the concept have emphasized particular characteristics of the process or product created (e.g., unexpected or surprising effects), or have required a more objective evaluation of the results that the inventor has obtained. However, no singular, universal conception of invention has emerged for the purposes of granting patent protection.[247] There is even variability as to the entity responsible for defining

[244] Correa, *supra* note 191.
[245] Gervais, *supra* note 240 at 9.
[246] *Id*.
[247] Correa, *supra* note 191 at 76-77.

the notion of invention. Thus, countries that are bound to the TRIPS Agreement are free to delineate this concept statutorily, administratively, or based on judicial precedent.[248]

In addition to these conceptual considerations, TRIPS leaves space for countries to define the notion of invention in the negative. That is, national governments may adopt a broad definition of the term "discovery" to narrow the meaning of invention, for example following the principle that products of nature are not patentable.[249] According to this conceptualisation, subject matter such as gene sequences or other molecular components of plants might be considered discoveries rather than inventions, and therefore be excluded from patent protection.[250]

This formal policy space has been utilised in many territories to variously define biological inventions. Although many developed countries have broadened the conceptualisation of invention to include biological materials, numerous developing countries have taken the opposite approach, excluding such materials from patent protection.[251] Both strategies are consistent with the TRIPS Agreement. If a country decided to use utility patents as a means to regulate plants as intellectual property, it could still elect to exclude DNA that has been isolated from a claimed plant from patent protection. This exclusion could operate as a means to ensure that researchers are not encumbered by third-party intellectual property when they employ biotechnological techniques to develop new plants.

A further area of definitional flexibility in the TRIPS Agreement surrounds the disclosure requirement. This is a crucial condition for the grant of patent rights, since sufficiency of disclosure is supposed to be the key consideration given by the applicant as part of the metaphorical patent bargain.[252] Despite – or perhaps in recognition of – the importance of the information disclosed in exchange for patent rights, the parameters of the disclosure requirement are not defined in the TRIPS Agreement.

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[248] *Id*.
[249] The understanding that products of nature unmodified by human action are ineligible for patents dates to at least the eighteenth century. This doctrine subsequently evolved in countries such as the United States, where it is now firmly established in national jurisprudence. Kevles, D. J. (2015). Inventions, Yes; Nature, No: The Products-of-Nature Doctrine from the American Colonies to the U.S. Courts. *Perspectives on Science, 23*(1), 13-34.
[250] Gervais, *supra* note 240.
[251] Correa, *supra* note 191 at 78.
[252] *See* Devlin, A. (2010). The Misunderstood Function of Disclosure in Patent Law. *Harvard Journal of Law & Technology, 23*(2), 401-446.

Thus, countries that are legally bound to TRIPS can require that applicants for utility patent protection disclose the "best mode for carrying out the invention known to the inventor,"[253] as is the case in the United States. Furthermore, national governments can limit protection to the embodiments of the invention for which the applicant has provided sufficient information to enable its reproduction.[254] For biological inventions, the scope of patent protection may be limited to those materials which have been physically deposited with the national patent office.[255]

Other possibilities could include the requirement that patent applicants disclose the country of origin of any biological or genetic material covered by the patent claims, and certify that the applicant has complied with the relevant rules governing access to such material.[256] In the context of plant breeding, the requirement that patent applicants divulge the origin of genetic resources used to develop new plant varieties and demonstrate evidence that prior informed consent was obtained from the providers of the resources could operate as a means to protect the interests of local communities. Such a condition could be designed in a way that would comply with the TRIPS Agreement while also upholding national commitments to the Convention on Biological Diversity, the Nagoya Protocol, and the Plant Treaty.[257]

Relatedly, the disclosure requirement could be used as a mechanism to grant legal attribution for earlier contributions to the inputs used to create a particular invention, as is often the case with traditional or indigenous knowledge surrounding uses of genetic resources.[258] Disclosures made in utility patent applications surrounding the use of traditional or indigenous knowledge to develop new plant varieties could enable the subsequent protection of this knowledge through other national legal frameworks. An example of such an interaction between systems for patents and traditional knowledge protection is found in the Ecuadorian intellectual property legislation that will be discussed in Part 2 of the thesis. Although there is

[253] TRIPS Agreement, Article 29.
[254] Correa, *supra* note 191.
[255] *Id*.
[256] Shadlen, *supra* note 224.
[257] De Carvalho, N. P. (2000). Requiring Disclosure of the Origin of Genetic Resources and Prior Informed Consent in Patent Applications Without Infringing the TRIPS Agreement: The Problem and the Solution. *Washington University Journal of Law and Policy, 2*, 371-401; De Carvalho, N. P. (2005). From the Shaman's Hut to the Patent Office: In Search of a TRIPS-Consistent Requirement to Disclose the Origin of Genetic Resources and Prior Informed Consent. *Washington University Journal of Law and Policy, 17*, 111-186.
[258] Shadlen, *supra* note 224.

significant uncertainty as to how protection for traditional knowledge might be granted under the TRIPS framework,[259] legally bound countries could still experiment with locally designed regimes to safeguard traditional knowledge, as Ecuador has done. As of 2018 no international consensus existed for how such knowledge should be legally protected, meaning that countries remained free to create legislation that would appropriately conform to national priorities and interests.

In addition to the fact that certain important terms and concepts are left undefined in TRIPS, the Agreement also affords freedom to determine the limits of acceptable patent claims. For instance, countries can prohibit "functional" claims, according to which the subject matter is not described as a process or product, but rather in terms of the functions that the invention performs.[260] Similarly, national laws can exclude "product-by-process" patents, where the claimed product is characterised by the process used for its procurement and not by the elements and structure of the product as such.[261] This latter exclusion could be incorporated into a utility patent law that allows for the protection of plants as intellectual property. The prohibition would ensure that inventions produced by new plant breeding methods are not patented, if the new plant varieties produced would not independently meet the requirements for protection.

Another option that countries which are legally bound to TRIPS could explore is to limit the number of claims that may be included in a single patent application. This could be a desirable strategy for developing countries, given that numerous studies have found evidence that "narrow" patents can create opportunities for local firms and innovators to invent around existing patents.[262] Based on the precedent set by the United States Plant Patent Act, patent applications claiming plants could be limited to a single claim, in which the applicant would be required to describe the novel and distinctive features of the invention in reasonably sufficient detail.

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[259] Gervais, D. (2005). Traditional Knowledge and Intellectual Property: A TRIPS-Compatible Approach. *Michigan State Law Review, 2005*, 137-166.
[260] Correa, *supra* note 191 at 88.
[261] *Id*.
[262] *See, e.g.,* Merges, R. P. & Nelson, R. R. (1990). On the Complex Economics of Patent Scope. *Columbia Law Review, 90*(4), 839-916; Maskus, K. E. & McDaniel, C. (1999). Impacts of the Japanese Patent System on Productivity Growth. *Japan and the World Economy, 11*(4), 557-574; Maskus, K. E. (2000). *Intellectual Property Rights in the Global Economy*. Washington, DC: Institute for International Economics; Chang, H. J. (2002). *Kicking Away the Ladder: Development Strategy in Historical Perspective*. London, UK: Anthem Press; Kumar, N. (2003). Intellectual Property Rights, Technology and Economic Development: Experiences of Asian Countries. *Economic and Political Weekly* (January 18, 2003).

In addition to the ambiguity surrounding patent claim drafting, the TRIPS Agreement does not specify how claims should be interpreted. This openness is a reflection of the fact that "[p]atent breadth…tends not to be a function of statute so much as of administrative and judicial practice (i.e., how patent examiners proceed, and what legal doctrines judges use in deciding infringement cases)."[263] Nevertheless, it has been argued that national legislatures should delimit the parameters of the "theory of equivalents" to be used within their jurisdictions, that is, to define the conditions under which inventions that are not literally described in a claim may be deemed equivalent and therefore infringing.[264] In so doing, governments could follow the example of countries such as Germany, where courts conduct an objective comparison of the elements that constitute the invention with those of the alleged infringer. Such a strategy has been argued to be advantageous for developing countries, because this approach weighs the protection of the inventor's interests against the ability of third parties to make improvements to the protected subject matter.[265]

Exceptions to Patent Rights

A second major source of formal policy space within the TRIPS Agreement derives from the permissible exceptions to the otherwise exclusive private rights that patents provide. Exceptions may be classed into two broad categories.[266] The first of these includes general exceptions, which are available to anyone at any time, and without the need to obtain government authorisation. General exceptions are not subject to time restrictions, and compensation need not be provided to the patent owner in exchange for use of the protected subject matter. Meanwhile, the second category includes specific exceptions, which require State authorisation and only apply to the party specified by government authorities. Specific exceptions are typically time limited, and compensation for the right holder is normally required.

[263] Shadlen, *supra* note 224 at 16.
[264] Correa, *supra* note 191 at 90.
[265] *Id*.
[266] Shadlen, *supra* note 224.

Article 30 of the TRIPS Agreement creates space for the various types of general exceptions that member countries may incorporate into their national utility patent laws. Specifically, Article 30 states,

> "Members may provide limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, *taking account of the legitimate interests of third parties*."[267]

This latter statement is especially important, since it reiterates the spirit expressed in the foundational objectives of the TRIPS Agreement, which proclaim that

> "The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, *to the mutual advantage of producers and users* of technological knowledge and in a manner conducive to social and economic welfare, and *to a balance of rights and obligations*."[268]

Read together, these provisions allow for the imagination of a variety of general exceptions to the exclusive rights that utility patents grant. Many countries have long incorporated such provisions into their national patent laws.[269] Some examples include limitations on patent rights for:

- Acts done privately and on a non-commercial scale, or for a non-commercial purpose;
- Use of the invention for research;
- Use of the invention for teaching purposes;
- Experimentation on the invention to test it or improve on it (allowing for "inventing around");
- Experiments conducted for the purposes of seeking regulatory approval for the commercialisation of a product after the expiration of a patent;
- Use of the invention by a third party that had used it *bona fide* before the date of application for the patent.[270]

Several of these general exceptions could be invoked to balance the rights of developers of new plant varieties with the interests of other stakeholders. For instance,

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[267] TRIPS Agreement, Article 30 (emphasis added).
[268] TRIPS Agreement, Article 7 (emphasis added).
[269] Garrison, C. (2006). *Exceptions to Patent Rights in Developing Countries*. Geneva: UNCTAD-ICTSD Project on IPRs and Sustainable Development. Issue Paper No. 17.
[270] These exceptions are enumerated in Correa, *supra* note 191.

an exception to the inventor's exclusive rights for acts done privately and on a non-commercial scale, or for non-commercial purposes could effectively inscribe a type of farmer's privilege in patent law, thereby allowing farmers to save, re-plant, or exchange seeds without obtaining authorisation from the right holder. Likewise, an exception for third parties who had used the invention *bona fide* before the date of application of the patent could also ensure that farmers are not subject to patent infringement actions in certain situations. This could occur, for instance, where farmers collaborate with plant breeders in participatory breeding projects that lead to the development of patented varieties.

Similarly, allowing for the use of plants protected with utility patents for investigative purposes or experimentation could encourage plant breeding by ensuring that research is not encumbered by the proprietary rights of third parties.[271] This could in turn benefit public research institutions and local seed industries in developing countries, which may not have the resources to pay royalties to right holders for the use of plants that have been protected as intellectual property. Furthermore, an exception for experiments conducted for the purposes of seeking regulatory approval for the commercialisation of protected plants after patent expiration could foster the development of generic industries for biotechnological plants, by reducing regulatory hurdles for public research institutions and local seed industries.[272]

In addition to these examples, another type of general exception available under the TRIPS Agreement concerns the exhaustion of patent rights. Countries that are bound to TRIPS are given autonomy under the Agreement to determine their own rules regarding exhaustion.[273] Specifically, TRIPS states that "nothing in this Agreement shall be used to address the issue of the exhaustion of intellectual property rights."[274] This means that countries can elect to allow for "parallel imports" or "grey-market imports," which are goods legitimately produced under a patent in one territory,

[271] Correa, C. M. (2012). *TRIPS-Related Patent Flexibilities and Food Security: Options for Developing Countries*. Quaker United Nations Office & International Centre for Trade and Sustainable Development.
[272] For a discussion of how generic biotech crops could be increasingly developed in the future, *see* Jefferson, D. J., Graff, G. D., Chi-Ham, C. L., & Bennett, A. B. (2015). The Emergence of Agbiogenerics. *Nature Biotechnology, 33*(8), 819-823.
[273] Shadlen, *supra* note 224.
[274] TRIPS Agreement, Article 6.

and then imported into a second territory without the authorisation of the local owner of the patent rights.[275]

The question of whether parallel imports are beneficial or harmful for national economic development is highly contested. On one side are arguments against parallel imports on the grounds that grey market products may inhibit innovation,[276] result in negative price discrimination effects for developing countries,[277] or encourage free riding.[278] In contrast, proponents of parallel imports invoke the concept of exhaustion as a mechanism to promote trade and the free movement of goods.[279] Under TRIPS, policymakers can examine the evidence offered in support of, and in opposition to, these divergent perspectives and decide for themselves whether or not parallel imports would benefit national policy goals. In the context of agriculture, governments could use the principle of exhaustion as a mechanism to enable grey-market trade in patented seeds. If demand were sufficiently high for a particular type of crop, the prices for protected seeds could be lowered through enhanced competition from distributors that are not obligated to pay royalties to the right holder. Decreased prices could increase farmers' access to improved planting material and in turn lower the prices that consumers pay for farm produce.

In addition to these various general exceptions, the TRIPS Agreement also permits specific exceptions to patent rights to be granted when special circumstances occur. Two broad types of specific exceptions have been recognised in national patent laws. The first is government use, which enables State authorities to use patented inventions to protect national security or public interest. The second type includes compulsory licenses, the grant of which involves government intervention to temporarily render patent rights non-exclusive in order that the protected invention may be widely made and used.

Exceptions for government use and compulsory licenses have long been incorporated into national utility patent laws. When the TRIPS Agreement entered into

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[275] Maskus, K. E. (2000). Parallel Imports. *The World Economy, 23*(9), 1269-1284.
[276] Li, C. & Maskus, K. E. (2006). The Impact of Parallel Imports on Investments in Cost-Reducing Research and Development. *Journal of International Economics, 68*(2), 443-455;
[277] Malueg, D. A. & Schwartz, M. (1994). Parallel Imports, Demand Dispersion, and International Price Discrimination. *Journal of International Economics, 37*(3-4), 167-195.
[278] Maskus, K. E. & Chen, Y. (2005). Parallel Imports in a Model of Vertical Distribution: Theory, Evidence, and Policy. In C. Fink & K. E. Maskus (eds). *Intellectual Property and Development: Lessons from Recent Economic Research*. Washington, DC: The World Bank.
[279] Calboli, I., & Lee, E. (2016). *Research Handbook on Intellectual Property Exhaustion and Parallel Imports.* Cheltenham, UK: Edward Elgar Publishing.

force in 1995, approximately one hundred countries already had some system of compulsory licensing in place in their respective national frameworks.[280] The inscription of compulsory licensing provisions in national patent laws dates to at least 1925, when the Paris Agreement was amended to allow countries to enact such mechanisms to prevent the abuse of patent rights.[281] Today, compulsory licenses are so firmly established in international law as valid limitations on patent rights that no complaint has ever been submitted under the World Trade Organization dispute settlement rules against a country that granted compulsory licenses or government use.[282]

Although the TRIPS Agreement affords parties broad latitude in designing compulsory licensing criteria, it also establishes a set of basic conditions that must be met for the grant of a non-voluntary license. These include the requirements that a case-by-case evaluation must be conducted; that third parties must first seek to obtain a voluntary license from the right holder (this requirement is waived in the case of national emergency); that the scope and duration of the license should be limited; that licenses must be non-exclusive and non-assignable; that the license must be primarily used to satisfy domestic market demand; and that the patent holder should be adequately remunerated.[283]

It is notable that the TRIPS Agreement only establishes the general parameters of these requirements, leaving space for interpretation by national governments. For instance, TRIPS does not specify how much negotiation is required with the right holder before a compulsory license may be granted.[284] Likewise, the meaning of "adequate remuneration" is not defined.[285] TRIPS also "permits national-level interpretation and adjudication to be *administrative*, not necessarily judicial, which significantly increases the ease of requesting and acquiring compulsory licenses."[286]

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[280] Bond, E., & Saggi, K. (2014). Compulsory Licensing, Price Controls, and Access to Patented Foreign Products. *Journal of Development Economics, 109*, 217-228.
[281] Reichman, J. H. (2003). Non-Voluntary Licensing of Patented Inventions: Historical Perspective, Legal Framework under TRIPS, and an Overview of the Practice in Canada and the USA. International Centre for Trade and Sustainable Development (ICTSD), Issue Paper No. 5.
[282] Correa, C. M. (2015). The Use of Compulsory Licenses in Latin America. In R. M. Hilty & K. C. Liu (eds.). *Compulsory Licensing*. Heidelberg, Germany: Springer. pp. 58.
[283] TRIPS Agreement, Article 31.
[284] Correa, *supra* note 191.
[285] *Id*.
[286] Shadlen, *supra* note 224 at 21 (emphasis in original).

Furthermore, TRIPS does not specify on what grounds compulsory licenses should be issued.[287] The Agreement does refer to five specific circumstances that could justify the issuance of a compulsory license, including (1) refusal to deal; (2) emergency and extreme urgency; (3) anti-competitive practices; (4) non-commercial use; and (5) dependent patents.[288] However, the enumeration of these specific situations does not limit the ability of World Trade Organization Member States to grant compulsory licenses on other grounds, such as to protect the environment or for reasons of public interest.[289] It is therefore also conceivable that governments could incorporate provisions on compulsory licensing for reasons of food security, or to invoke other justifications – for example, anti-competitive pricing – to ensure that patented plant varieties remain broadly accessible. This is because avoiding food shortages or mitigating the most severe effects of crop failure would surely be construed as national emergencies or as necessary to protect the public interest.

In short, countries that are legally bound to the TRIPS Agreement could meet the Article 27.3(b) requirement by expanding the ambit of patents to cover new plant varieties. Compliance could be ensured through two general means: (1) by recognising plant varieties as patentable subject matter in the national utility patent law; or (2) by developing a specialised plant patent framework, as was done in the United States. Although scholars usually dismiss patents as a viable alternative to satisfy the Article 27.3(b) obligation, substantial formal policy space exists in the TRIPS Agreement for countries to engage in experimentation at the national level.

Nevertheless, it is likely that the majority of countries that are legally bound to the TRIPS Agreement will continue to follow the recent global trend, by granting intellectual property protection for plants in the form of *sui generis* legislation. While one reason for this may be the broad perception that patents are an inappropriate means to recognise intellectual property for plant varieties, a likely parallel explanation is the impact that the template of plant breeders' rights based on the UPOV Convention has had on lawmaking. However, while the UPOV model continues to proliferate worldwide, as Chapter 1 showed, a substantial number of countries are still only legally bound to the TRIPS Agreement or remain legally unbound. The following section will explore the nature of the formal policy space available under the TRIPS Agreement

[287] Doha Declaration on the TRIPS Agreement and Public Health, paragraph 5.b.
[288] TRIPS Article 31.
[289] Correa, *supra* note 191 at 93.

for such countries to develop *sui generis* intellectual property laws for plants, which are not necessarily based on the UPOV Convention.

2.2. Alternative 2: *Sui Generis* Systems

In contrast to territories that are obligated to adhere to the TRIPS Agreement, the UPOV Convention, or other international instruments such as free trade agreements, legally unbound countries enjoy the ability to enact any system that they deem appropriate for the governance of plants as intellectual property. Alternatively, legally unbound countries can choose not to provide intellectual property for plants at all, or to offer only a limited form of exclusive rights. For both legally unbound countries and countries that are only legally bound to the TRIPS Agreement, the most attractive option for lawmaking may be to implement a *sui generis* system of intellectual property for plants.

As discussed in previous sections, many World Trade Organization Member States have elected to follow the model of the UPOV Convention as a means to grant intellectual property for plants. This thesis has argued that this broad adoption of the UPOV model may be understood as an example of how the logic of plant breeders' rights has proliferated in many parts of the world. Indeed, scholars have recognised that the UPOV Convention is regularly viewed as a standardised template for countries to enact systems for the regulation of plants as intellectual property in a manner that is consistent with the TRIPS Agreement.[290]

It is likely that the logic of plant breeders' rights has proven to be durable for several reasons. These include the perception that joining the UPOV Convention will result in agricultural or economic development, as conceptualised according to the tenets of global free-market capitalism. Supporters of advanced scientific and technological approaches to plant breeding regularly argue that recognising breeders' rights according to the UPOV model is the only effective means to encourage foreign plant breeders to introduce their improved varieties into new markets.[291] The logical

[290] Dutfield, G. (2011). Food, Biological Diversity and Intellectual Property: The Role of the International Union for the Protection of New Varieties of Plants (UPOV). Quaker United Nations Office, Global Economic Issue Publications. Intellectual Property Issue Paper No. 9.
[291] Jaffer, W. & Van Wijk, J. (1995). *The Impact of Plant Breeders' Rights in Developing Countries: Debate and Experience in Argentina, Chile, Colombia, Mexico, and Uruguay*. Inter-American Institute for Cooperation on Agriculture, University of Amsterdam. Pg. 36

conclusion of this argument is that if governments do not join the UPOV Convention, they deprive their farmers of the best germplasm, and by extension the ability to earn higher profits. Such perspectives implicitly assume that agriculture operates uniformly in all world regions, or alternatively that all countries aspire to the same industrialised, market-driven model.

Notwithstanding the expansion of the UPOV Convention standard for plant breeders' rights, it is notable that the TRIPS Agreement grants signatories broad latitude to develop local *sui generis* systems that may deviate significantly from the UPOV approach. Prior analyses have argued that there are four essential components that a *sui generis* intellectual property law for plants must have to comply with TRIPS.[292] The first of these is that the law must apply to plant varieties from all species and botanical genera. Second, the law must grant an intellectual property right, which means that the right holder should have the exclusive ability to control particular acts with respect to protected plant varieties or at a minimum the right to remuneration when third parties engage in certain acts.[293]

Third, *sui generis* regimes must adhere to the general TRIPS provision to grant national treatment and most-favoured nation treatment to all right holders. In other words, countries must ensure that non-nationals have the same advantages that their own citizens enjoy.[294] A fourth criterion that prior studies have identified is that *sui generis* intellectual property laws for plants must follow the enforcement rules outlined in Part III of the TRIPS Agreement.

In addition to these conditions, Article 27.3(b) of TRIPS specifies that *sui generis* regimes must be "effective."[295] Although the TRIPS Agreement does not provide any criteria for effectiveness, the term has been interpreted to mean that the law must provide for the implementation of juridical procedures so that owners of plant variety certificates may execute their rights.[296] However, effectiveness in the TRIPS context does not depend on the requirements stipulated for intellectual property

[292] Leskien, D. & Flitner, M. (1997). *Intellectual Property Rights and Plant Genetic Resources: Options for a* Sui Generis *System.* International Plant Genetic Resources Institute, Issues in Genetic Resources Paper No. 6; Helfer, *supra* note 54.
[293] Helfer, *supra* note 54 at 56.
[294] TRIPS Agreement, Article 1.3.
[295] TRIPS Agreement, Article 27.3(b).
[296] Seiler, A. (1998). Sui Generis Systems: Obligations and Options for Developing Countries. *Biotechnology and Development Monitor, 34*, 2-5.

protection, or on the level of protection granted.[297] Therefore, an effective *sui generis* system may be understood as one that offers redress to right holders in the event that infringement occurs. Some scholars have taken this interpretation further, arguing that the only truly effective legal frameworks are those that can provide protection to the largest range of plant varieties possible. This argument holds that in addition to plant breeders' rights, an effective system should provide a system of intellectual property protection for plants developed by actors other than professional breeders, such as individual farmers or local communities.[298]

Apart from the few criteria that are explicitly or implicitly mandated by TRIPS, the Agreement grants World Trade Organization Member States broad discretion to design national *sui generis* intellectual property laws for plants. One of the most important areas that is left undefined in the TRIPS Agreement relates to the requirements that applicants must fulfil to obtain protection. As discussed in Chapter 1 of the thesis, the UPOV Convention mandates that plant varieties must be new, distinct, uniform, and stable in order to receive protection. However, countries that are legally bound to the TRIPS Agreement but not to the UPOV Convention need not inscribe these criteria in their national intellectual property laws for plants.

Many previous analyses have recommended that countries consider the enactment of alternative requirements for protection that would be less rigid than the UPOV criteria. The thresholds of uniformity and stability have been especially criticised as too difficult for many farmers or farming communities qua breeders to meet to obtain protection for the "local" varieties of plants that they develop. Local varieties – also regularly termed "landraces," "heirloom varieties," or "farmers' varieties" – are frequently more genetically heterogeneous than varieties developed by professional breeders.[299] Therefore, countries could consider replacing the criteria of uniformity and stability with "identifiability" or other, similar concepts as a means to provide intellectual property for local plant varieties that have been derived through customary methods.[300] Alternatively, a *sui generis* regime could retain the distinctness, uniformity,

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[297] Leskien & Flitner, *supra* note 292 at 32.
[298] Dhar, *supra* note 57.
[299] Helfer, *supra* note 54 at 71.
[300] *Id*. *See also* Leskien & Flitner, *supra* note 292 at 54; Correa, *supra* note 8; Robinson, D. (2007). *Exploring Components and Elements of* Sui Generis *Systems for Plant Variety Protection and Traditional Knowledge in Asia*. International Centre for Trade and Sustainable Development (March 2007).

and stability requirements for plant varieties developed by professional breeders, while creating a separate category for genetically heterogeneous varieties that would be subject to different criteria.[301] Thus, countries that are not legally bound to the UPOV Convention have substantial formal policy space for the definition of the requirements for plants to be protected as intellectual property.

The TRIPS Agreement also provides broad formal policy space for *sui generis* intellectual property laws for plants to establish locally adapted criteria to exclude certain varieties from protection. Although the Article 27.3(b) obligation has been interpreted as requiring the recognition of protection for all botanical genera and species, specific varieties could be excluded based on several criteria. For instance, the law could prohibit cumulative protection, such that varieties of plants that have already been patented would not be eligible for registration under the *sui generis* regime.[302] Such a restriction is already operative in countries that adhere to the 1978 version of the UPOV Convention.

Additionally, under TRIPS, a *sui generis* law could be deemed to not apply to either plant varieties that have merely been discovered (in any setting), or to varieties that have been discovered specifically in the wild.[303] By selecting the latter option, countries could enable the protection of varieties that come into existence through natural mutations or other genetic variations, but which are developed under controlled conditions to have broad benefit. In other words, in order to be protectable, discovered varieties would need to be complemented by human intervention, such as through evaluation and propagation of the variety.[304] This could encourage the development of varieties with improved traits, while also ensuring that exclusive rights are not granted over plant genetic resources that have not been subjected to a threshold level of intercession by a human actor, whether in a professional or a local agricultural setting.

Furthermore, *sui generis* intellectual property laws for plants could exclude certain varieties from protection for the same reasons that the TRIPS Agreement

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[301] Leskien & Flitner, *supra* note 292 at 54.
[302] Seiler, *supra* note 296. Such a provision would reinscribe the prohibition on cumulative protection found in the 1978 version of the UPOV Convention (Article 2.1).
[303] The Crucible II Group. (2001). *Seeding Solutions, Vol. 2: Options for National Laws Governing Control Over Genetic Resources and Biological Innovations.* International Development Research Centre, pp. 138-39.
[304] *Id*.

enumerates as exceptions to patent protection. These grounds for exclusion include to protect *ordre public* or morality; to safeguard human, animal, or plant life or health; or to avoid serious prejudice to the environment.[305] A *sui generis* framework could also prohibit the registration of certain varieties of plants for reasons that are not specifically enumerated in TRIPS, such as to guarantee food security or food sovereignty, based on the Agreement's general objective to provide intellectual property protection "in a manner conducive to social and economic welfare."[306] These factors would all be subject to local interpretation, and it is clear that what constitutes concepts such as *ordre public* or morality in relation to the use of plant genetic resources differs significantly from country to country. For instance, in some territories the development and cultivation of genetically modified plants might be considered to violate *ordre public*,[307] while in others transgenic plants have been welcomed.

Legally unbound countries and countries that are only subject to the TRIPS Agreement could also embed additional conditions on the grant of protection in *sui generis* frameworks. For instance, parties who apply to obtain intellectual property protection for a new plant variety could be required to disclose the source of origin of the genetic material used to develop the variety, as well as to declare that prior informed consent was obtained from the country or community that provided the material.[308] Such provisions could facilitate the implementation of other international obligations to which countries may be legally bound, for instance those which are mandated in the Convention on Biological Diversity,[309] the Nagoya Protocol,[310] or the Plant Treaty.[311]

Moreover, a declaration of origin requirement could be used to prevent misappropriation and unauthorised exploitation of national agrobiodiversity – what is frequently termed "biopiracy" – or to ensure the equitable sharing of benefits derived from the commercialisation of plant varieties developed from locally sourced materials.[312] The TRIPS Agreement also provides space for World Trade Organization

[305] TRIPS Agreement, Article 27.2.
[306] TRIPS Agreement, Article 7.
[307] The Crucible II Group, *supra* note 303.
[308] Helfer, *supra* note 54 at 73-74.
[309] Convention on Biological Diversity, Article 15.
[310] Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, Article 5; Article 6.
[311] International Treaty on Plant Genetic Resources for Food and Agriculture, Article 9.
[312] Helfer, *supra* note 54 at 74.

Member States to develop additional mechanisms to protect local communities that rely on customary agricultural practices. These protections could take the form of gene funds, mediation procedures for the protection of local interests, and registers of local plant varieties.[313]

Another area in which the TRIPS Agreement provides a broad formal policy space for signatories to develop *sui generis* laws that could be appropriately tailored to the particulars of their national agricultural sectors relates to the scope of and exceptions to the rights granted. For instance, countries could limit protection to the vegetative or reproductive propagating material of plants and not to harvested material. This means that intellectual property would only extend to the inputs and not the outputs of farming.[314] Similarly, countries could elect whether to include protection for plant varieties that are "essentially derived" yet sufficiently distinct from a protected variety.

On the one hand, it has been argued that expanding the scope of intellectual property protection to cover essentially derived varieties could foster progress in plant improvement by incentivising the use of biotechnological tools while preventing "copycat breeding."[315] On the other, the protection of essentially derived varieties has been derided as a limitation on the historic "free access" of breeders to commercialise new varieties developed from protected varieties without being required to pay remuneration to any owners.[316] Given that the concept of essential derivation remains contested more than two decades after its first formal embodiment in UPOV 1991,[317] it is significant that countries which are only legally bound to the TRIPS Agreement and not to UPOV 1991 still have the option to decide whether to protect essentially derived varieties in their *sui generis* frameworks.

Under the TRIPS Agreement, countries can also adapt *sui generis* intellectual property laws for plants to the realities of local agricultural practices through calibration of exceptions to the rights granted to plant breeders, including via inscription of a "farmers' privilege." This concept refers to the recognition that farmers have historically relied on the ability to reproduce planting material – including from varieties that are

[313] Seiler, *supra* note 296 at 4.
[314] The Crucible II Group, *supra* note 303 at 165.
[315] *Id* at 143.
[316] *Id.*
[317] Lawson, C. (2016). Plant Breeder's Rights and Essentially Derived Varieties: Still Searching for Workable Solutions. *European Intellectual Property Review, 32*, 499-517.

protected under intellectual property laws – for personal and non-commercial use without requiring permission from the right holder.[318] Countries whose agricultural systems are predominantly characterised by customary practices could adopt a broad farmers' privilege, while still offering sufficiently strong protection to encourage the importation of improved propagating material.[319] Moreover, legally unbound countries and territories that are only subject to the TRIPS Agreement enjoy the ability to define "non-commercial use" in the context of the farmers' privilege, such that under certain circumstances, farmers may be permitted to sell the propagating material of protected varieties as part of customary "over the fence" or "brown bagging" farming practices.[320]

In addition to incorporating exceptions to proprietary rights for use by farmers, countries that are only legally bound to the TRIPS Agreement may also permit use without authorisation of the right holder in other circumstances. For instance, the scope of intellectual property protection could be deemed to not extend to activities conducted privately and for non-commercial purposes; research; or the breeding of other varieties.[321] Similar exceptions are also available to countries that are members of the 1978 and 1991 versions of the UPOV Convention.

In legally unbound countries and countries that are only subject to the TRIPS Agreement, exceptions to otherwise exclusive proprietary rights could be written to protect the interests of diverse national stakeholders, who might include plant breeders, farmers, and scientific researchers. For instance, in countries whose agricultural sectors are characterised by both customary farming practices and industrial agricultural production of non-food plants, the national *sui generis* law could allow the right holder to subject the use of a protected ornamental variety for propagating purposes to payment of equitable remuneration.[322] Simultaneously, the regime could prevent the right holder from claiming compensation for similar uses of food crops.

Furthermore, in countries that are not legally bound to the UPOV Convention, a broad formal policy space exists in relation to the way "plant variety" is defined for

[318] Salazar, R., Louwaars, N. P. & Visser, B. (2006). On Protecting Farmers' New Varieties: New Approaches to Rights on Collective Innovations in Plant Genetic Resources. CGIAR Systemwide Program on Collective Action and Property Rights, CAPRi Working Paper No. 45, p.13.
[319] Helfer, *supra* note 54 at 76.
[320] The Crucible II Group, *supra* note 303 at 170.
[321] *Id*. at 167-68.
[322] Correa, *supra* note 8.

the purposes of intellectual property protection. The UPOV Convention focuses solely on providing protection for plant varieties developed by professional plant breeders, which must be new, distinct, uniform, and stable. In contrast, *sui generis* systems in legally unbound countries or in countries subject only to the TRIPS Agreement can incorporate additional mechanisms to grant rights over different categories of plants. These could include landrace or local plant varieties, which may be understood as those which originate through the progressive application of knowledge developed by farmers over the course of generations.[323]

In jurisdictions not legally bound to the UPOV Convention, another set of requirements could be written for the protection of local plant varieties. This category could be understood as containing plants that exist only in specific geographic areas and which therefore could be the subject of collective or community rights.[324] Finally, in legally unbound or TRIPS-only countries, intellectual property could be allocated in relation to the use of the wild relatives of plant varieties, based on the value of these plants for cross-breeding or genetic resources conservation.[325]

Sui generis intellectual property laws for plants in legally unbound countries or in territories subject only to the TRIPS Agreement could also be limited in an array of other ways in comparison to the model established by the UPOV Convention. For instance, the TRIPS Agreement provides no guidance in relation to the duration of time for which plant varieties should be the subject of exclusive rights. Under UPOV 1978, plant breeders are granted eighteen years of protection for trees and vines, and fifteen years for all other species.[326] UPOV 1991 lengthens these periods to twenty-five years for trees and vines and twenty years for all other species.[327] Both of these versions of the UPOV Convention are consistent with the TRIPS Agreement. However, legally unbound countries and TRIPS-only territories need not follow these precedents. In other words, the duration of protection could be set at a longer or shorter period, or different lengths of protection could be granted for different categories of plant varieties.[328]

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[323] Robinson, *supra* note 300 at 23.
[324] *Id*. at 28.
[325] *Id*. at 31.
[326] UPOV 1978, Article 8.
[327] UPOV 1991, Article 19.
[328] The Crucible II Group, *supra* note 303 at 172-73.

Furthermore, *sui generis* intellectual property laws for plants could subject any rights granted to exhaustion provisions, similar to those discussed above in relation to utility patents. This means that the exclusive protection conferred could be deemed to not extend to any material of a claimed plant variety that has been sold or otherwise marketed by the right holder or with his or her consent in the territory of the country in question.[329] The inclusion of an exhaustion provision could ensure that the law allows owners of proprietary rights in plant varieties to only exercise their rights and receive remuneration once in every production cycle, rather than collect royalties multiple times based on a single sale.[330]

Legally unbound countries and countries subject only to TRIPS could also inscribe a system of compulsory licenses in their *sui generis* regimes as a means to balance the interests of multiple stakeholders. As described earlier in relation to utility patents, TRIPS Article 31 provides for certain specific restrictions on compulsory licenses, including case-by-case evaluation, prior negotiation, limited scope and duration, non-exclusivity, and equitable remuneration.[331] It is unclear whether *sui generis* systems for the protection of plants as intellectual property would need to comply with the provisions of Article 31. While some scholars contend that the application of Article 31 to Article 27.3(b) is clearly intended by the spirit of TRIPS, others hold that intellectual property laws for plants could contain much stronger compulsory licensing provisions than those associated with utility patents, while still satisfying the "effectiveness" criterion of Article 27.3(b).[332]

In any case, as with patents, *sui generis* regimes could allow compulsory licenses to be granted in a variety of circumstances, including refusal to deal; emergency and extreme urgency; anti-competitive practices; for non-commercial use; and for reasons of dependency.[333] Furthermore, scholars have argued that compulsory licenses could be granted to ensure broad access to plant varieties protected with intellectual property for reasons not specifically mentioned in TRIPS but that are implied in the Agreement. These could include for the purposes of protecting the environment or public interest.[334] Following the same rationale, compulsory

[329] *Id*. at 173-74.
[330] *Id*.
[331] TRIPS Agreement, Article 31.
[332] The Crucible II Group, *supra* note 303 at 176.
[333] TRIPS Article 31.
[334] Correa, *supra* note 191 at 93.

licenses for protected plant varieties could also ostensibly be granted to ensure food security, given that the need to feed the population should fit within the definition of public interest in all countries.

In recent years, efforts have been made to clarify and amalgamate the various policy options available to legally unbound countries and to territories that are only subject to the TRIPS Agreement, for the purposes of developing *sui generis* intellectual property laws for plants. For instance, Correa has generated a policymaking "tool" that specifically addresses the needs of developing countries, towards the end of providing an alternative to the UPOV 1991 model for plant breeders' rights.[335] This work draws inspiration from the *sui generis* laws that India, Thailand, and Malaysia have enacted and implemented. These three countries are all legally bound to the TRIPS Agreement but not to the UPOV Convention.

Correa's proposal explores numerous elements that developing countries could incorporate into *sui generis* laws for the regulation of plants as intellectual property. Most prominently, the proposed regime creates a typology that includes three categories of plant varieties: (1) new uniform plant varieties; (2) new farmer and other heterogeneous varieties; and (3) traditional farmers' varieties.[336] The first category would create a system of intellectual property for varieties developed by plant breeders, according to a model that approximates the 1978 version of the UPOV Convention. Meanwhile, the Correa model also proposes a means of protection for new farmer and other heterogeneous varieties, but based on laxer requirements than those that than new uniform plant varieties would need to meet. Thus, for the second category intellectual property would be granted based on the criteria of novelty, distinctness, and identifiability.[337]

The right holder of a new farmer or other heterogeneous variety would have the right to receive remuneration, but not to exploit the protected variety exclusively. Thus, Correa's proposal would not restrict the use of these varieties by third parties, but payment to the right holder would be required in the event that the variety were commercialised.[338] Finally, intellectual property protection would be available for traditional farmers' varieties, subject only to the criterion of identifiability.[339] Traditional

[335] Correa, *supra* note 322.
[336] *Id*. at 48.
[337] *Id*.
[338] *Id*.
[339] *Id.*

farmers' varieties would also receive a remuneration right, but payment would be made directly to a national Seed Fund. Income from this Fund would be used to support the conservation and sustainable use of plant genetic resources, especially via on-farm conservation practices and through the establishment of community seed banks.[340]

Similar proposals to the Correa model have examined how developing countries could implement a "differentiated approach" to the governance of plants as intellectual property. Like the Correa framework, these policy recommendations have specifically addressed the need to protect the interests of diverse stakeholders in countries whose agricultural sectors are characterised by small-scale and customary farming practices. For instance, De Jonge and Munyi recommended establishing different levels of protection for different crops in relation to different categories of farmers.[341] Thus, a *sui generis* system of intellectual property for plants could allot special treatment to smallholder farmers, who could be defined based on metrics such as farm size or cropping area, actual production or production capacity, or profits or income.[342]

The farmers' privilege delineated under the De Jonge and Munyi model would exempt farmers who meet the definition of smallholder from infringing any proprietary rights granted to plant breeders, thereby allowing them to use, exchange, and sell the farm-saved seed of any protected varieties. In contrast, the activities of non-smallholder farmers would not be exempted from the requirement to obtain authorisation from the right holder for commercial uses of protected plant varieties. Nevertheless, non-smallholder farmers would be allowed to use the farm-saved seed of certain crops on their own holdings while paying a reduced royalty to the right holder.[343]

One important difference between the proposals launched by Correa and De Jonge and Munyi, respectively, is that the latter specifically considers options that are available to countries that are legally bound to both the TRIPS Agreement *and* the UPOV Convention. Conversely, Correa's model – as with several other, older

[340] *Id*. at 49.
[341] De Jonge & Munyi, *supra* note 66 at 39.
[342] *Id*. at 40.
[343] *Id*.

proposals[344] – is targeted towards legally unbound countries and territories that are only subject to the TRIPS Agreement. This is a significant distinction, because although the Correa model for a *sui generis* system of intellectual property for plants contains many interesting elements, this proposal is relevant to fewer and fewer countries with each passing year.

As discussed in Chapter 1 of the thesis, over the course of the past few decades or so, many countries have either independently joined UPOV or entered into bilateral or regional free trade agreements that require adherence to the Convention. For such territories, the recommendations offered by De Jonge and Munyi could be of interest to aid in the design of *sui generis* intellectual property laws for plants. However, it is also important to recognise that the De Jonge and Munyi model does not include options for how countries that are legally bound to the UPOV Convention might reconcile their obligations under this treaty with commitments to implement the provisions of other international instruments, including the Convention on Biological Diversity, the Nagoya Protocol, and the Plant Treaty.

The following section addresses this gap in the literature by offering two potential "standardised" options for how countries that are legally bound to the TRIPS Agreement and the UPOV Convention could square these obligations with other international commitments related to the regulation of plant genetic resources. These options are described as standardised because they do not take into account the various local factors that could influence how national laws related to intellectual property for plants, agrobiodiversity conservation, protection of customary agricultural practices, or other subject matter are designed and implemented. Instead, the following section outlines a series of general doctrinal considerations that countries should attend to when seeking to comply with international obligations surrounding the regulation of plant genetic resources. Subsequently, Chapter 5 will derive a series of lessons from the Ecuadorian case study, which demonstrate how lawmaking processes related to this subject matter have unfolded in one particular country.

[344] *See, e.g.,* Helfer, *supra* note 54; Dhar, *supra* note 57; Shadlen, *supra* note 224; The Crucible II Group, *supra* note 303.

2.3. Standardised Approaches to the Governance of Different Types of Plants

Chapter 1 of the thesis showed that as of 2018, there were only sixty-three countries in the world that were legally unbound. This means that these countries were not obligated under the terms of any international instrument to establish systems of intellectual property for plants. However, it is notable this group of legally unbound countries included twenty-six Member States of the World Trade Organization that were classified as least developed countries. Because these territories ostensibly will be required to comply with the TRIPS Agreement by 1 July 2021, it is expected they will soon convert into legally bound countries.

Meanwhile, in 2018 a total of one hundred and forty-three countries were already legally bound to one or more international obligations that mandate minimum standards for the regulation of plants as intellectual property. Fifty of these territories were only obligated to give effect to the TRIPS Agreement, meaning that they could conceptualise plant varieties as patentable subject matter, develop a *sui generis* regime for the protection of plant varieties with intellectual property, or institutionalise some combination of both systems. An additional ninety-three countries had joined the UPOV Convention, and the vast majority (seventy-eight) were legally bound to UPOV 1991. Limited options existed for these territories to develop innovative *sui generis* frameworks to protect plants as intellectual property, as they were required to enact a system to grant plant breeders' rights that would comply with the relevant version of the UPOV Convention.

Concomitant with the expansion of international agreements that set minimum standards for the regulation of plants as intellectual property at the national level, in recent years several other treaties related to governance of plant genetic resources have entered into force. Chapter 1 introduced these regimes, which include the Convention on Biological Diversity, a treaty that is concerned with the conservation and sustainable use of biological resources. Another relevant international instrument is the Plant Treaty of the Food and Agriculture Organization of the United Nations, which covers agrobiodiversity conservation and the protection of customary farming practices. Finally, the Nagoya Protocol to the Convention on Biological Diversity sets standards for accessing and using plant genetic resources and associated traditional knowledge, as well as for equitable benefit sharing. Even as an increasing number of

countries become legally bound to the TRIPS Agreement and the UPOV Convention, many are also assuming other obligations under the Convention on Biological Diversity, the Plant Treaty, and the Nagoya Protocol.

Actors in the international system are aware of this dynamic, and it is for this reason that in 2018, representatives of the Union for the Protection of New Varieties of Plants on the one hand, and the United Nations Food and Agricultural Organization on the other, were engaged in talks designed to identify possible synergies between the UPOV Convention and the Plant Treaty.[345] Much of the discussion centred on how the proprietary rights of plant breeders might be reconciled with policymaking goals related to customary agricultural practices, such that countries could honour their obligations under the UPOV Convention and the Plant Treaty simultaneously. However, it is difficult to ascertain whether good faith interactions between the administrators of these intersecting international agreements could actually result in concrete changes to either regime, towards the end of rendering each one more compatible with the other. The 1991 version of the UPOV Convention is structured such that its provisions at best may limit the implementation of the Plant Treaty, and at worst may actively impede the implementation of protections for practices such as seed saving and exchange in farmer-to-farmer networks.[346]

In this context, it is important to trace how countries that are legally bound to multiple overlapping treaties may experiment with laws that would accomplish various policy goals that may not immediately appear compatible with one another. Specifically, it is important that governments understand how they might uphold obligations to establish intellectual property laws for plants – and thereby grant breeders' rights protection consistent with the UPOV Convention – while also safeguarding other national interests. One concrete reason for this need for reconciliation is the likelihood that in many countries, farmers who rely on customary agricultural practices will interact increasingly with professional plant breeders.

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[345] *See* Proceedings of the Symposium on Possible Interrelations between the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) and the International Convention for the Protection of New Varieties of Plants (UPOV Convention). Geneva, 26 October 2016.

[346] Shashikant, S. (2016). International Contradictions on Farmers' Rights: The Interrelations Between the International Treaty, its Article 9 on Farmers' Rights and Relevant Instruments of UPOV. Proceedings of the Symposium on Possible Interrelations between the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) and the International Convention for the Protection of New Varieties of Plants (UPOV Convention). Geneva, 26 October 2016.

Such collaboration may be necessary in many territories as a means to address important challenges such as the attainment of food security and adaptation to climate change. Some governments have already begun to promote interactions between farmers and professional breeders, for instance through programmes designed to foster the collaboration and exchange of seeds and related knowledge or to establish formal agreements between rural communities and scientific institutions surrounding the distribution of monetary and non-monetary benefits derived from collaborative activities, such as participatory plant breeding.[347] Given the growing diversity of the forms of agriculture that are practiced in many countries, it is crucial that governments develop complementary rather than competitive approaches to regulate the access and use of different types of plants.

The following sections consider two standardised options that countries which are legally bound to both the UPOV Convention and one or more additional obligations under the Convention on Biological Diversity, the Plant Treaty, or the Nagoya Protocol, could pursue to legislate rights over plants according to the logic of intellectual property, while also fulfilling other policy goals. The situations of legally unbound countries and territories that are subject only to the TRIPS Agreement are also contemplated in this analysis. The two general, standardised options that governments could study are: (1) a unified law to cover all pertinent interests; and (2) separate frameworks, one for intellectual property and one designed to address other issues related to the uses of certain types of plants. In addition, countries could also consider implementing a plurality of laws to regulate the access and use of different types of plants. This third option will be discussed in Chapter 5, in the form of lessons learned from the Ecuadorian case study.

Option 1: A Unified Law

The first standardised lawmaking option that legally bound countries could consider is legislation that would (1) establish a system of plant breeders' rights consistent with the UPOV Convention, and (2) simultaneously institutionalise other

[347] Vernooy, R. (2017). Options for National Governments to Support Farmer Seed Systems. The Cases of Kenya, Tanzania and Uganda. Hivos and Bioversity International. *Retrieved from* https://cgspace.cgiar.org/bitstream/handle/10568/80762/Options_for_national_Vernooy.pdf?sequence=1&isAllowed=y.

goals related to the uses of certain types of plants. Although Option 1 may appear to be the most parsimonious, it might also be the most implausible. As discussed in prior sections of this thesis, the 1991 version of the UPOV Convention may operate to impede certain customary agricultural practices, such as seed saving or the exchange of planting material with other farmers.[348] Therefore, for countries that are legally bound to UPOV 1991, it is unlikely that the creation of a unified framework pursuant to Option 1 would be viable.

However, in comparison to the 1991 version of the UPOV Convention, UPOV 1978 offers substantially more policy space for the realisation of other goals, especially in relation to farmers' customary seed management practices.[349] Although UPOV 1978 ceased to accept new accessions following the entry into force of UPOV 1991, fifteen territories are still members of the earlier version of the Convention. Membership in UPOV 1978 is comprised of several Latin American States, a small number of industrialised nations such as New Zealand and Norway, and populous developing countries including Brazil, China, and South Africa.

Many of these UPOV 1978 members are also bound to additional obligations under the Convention on Biological Diversity, the Plant Treaty, or the Nagoya Protocol, meaning that their governments must weigh several competing priorities related to the regulation of different types of plants. Such countries could consider amending their current plant breeders' rights laws to recognise other goals in a way that would not risk undermining UPOV 1978. Legally unbound countries and territories that are only subject to the TRIPS Agreement could also consider Option 1, given that they enjoy broad latitude surrounding how to conceptualise plants as intellectual property.

As of 2018, none of the UPOV members had deviated substantially from the template law that the Convention provides. Nevertheless, the precedents set by certain non-UPOV countries for how to balance multiple interests related to the

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[348] *See, e.g.,* Correa, *supra* note 8; Berne Declaration, *supra* note 64; Louwaars, N. P., Tripp, R., Eaton, D., Henson-Apollonio, V., Hu, R., Mendoza, M., Muhhuku, F., Pal, S., & Wekundah, J. (2005). Impacts of Strengthened Intellectual Property Rights Regimes on the Plant Breeding Industry in Developing Countries. A Synthesis of Five Case Studies. Wageningen UR. *Retrieved from* https://www.iprsonline.org/resources/docs/LouwaarsCGN_Plants_05.pdf; De Schutter, O. (2009). Seed Policies and the Right to Food: Enhancing Agrobiodiversity, Encouraging Innovation. Report by the UN Special Rapporteur on the Right to Food (A/64/170). Presented at the 64th session of the UN General Assembly, October 21, 2009; GIZ Germany. (2015). The UPOV Convention, Farmers' Rights and Human Rights: An Integrated Assessment of Potentially Conflicting Legal Frameworks. *Retrieved from* https://www.giz.de/fachexpertise/downloads/giz2015-en-upov-convention.pdf.

[349] Shashikant, *supra* note 346.

governance of different types of plants in a unitary framework may be informative. Worldwide, the most frequently studied example of an innovative *sui generis* intellectual property law for plants is the Protection of Plant Varieties and Farmers' Rights Act, 2001 of India.[350] The Indian regime creates a variegated system of rights over plant varieties, in which different categories of varieties are eligible for registration.

Thus, the Indian law protects new plant varieties based on the same novelty, distinctness, uniformity, and stability requirements as those outlined in the UPOV Convention. Meanwhile, the regime also explicitly recognises that plant breeding is an activity that farmers and not just professional breeders regularly undertake. Thus, under the Indian law "a farmer who has bred or developed a new variety shall be entitled for registration and other protection in like manner as a breeder of a variety under this Act."[351] Additionally, the law allows for the registration of "extant varieties."[352] In order to receive protection, extant varieties must satisfy the distinctness, uniformity, and stability criteria, though they need not be novel. The testing protocol is also relaxed for extant varieties in comparison to new varieties,[353] which means that relatively more heterogeneous plant varieties – such as landraces – are more likely to meet the standards for protection.

For new plant varieties, the breeders' rights framework provided in the Protection of Plant Varieties and Farmers' Rights Act of India is similar to that of the 1978 version of the UPOV Convention. Accordingly, the law provides an exclusive right to produce, sell, market, distribute, import, or export protected varieties.[354]

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[350] The Indian legislation has been comprehensively studied by numerous scholars over the past seventeen years. For critical analysis of the law, *see, e.g.,* Sahai, S. (2001). Plant Variety Protection and Farmers' Rights Law. *Economic and Political Weekly, 36*(35), 3338-3342; Tripp, R., Louwaars, N., & Eaton, D. (2007). Plant Variety Protection in Developing Countries. A Report from the Field. *Food Policy, 32*(3), 354-371; Dhar, *supra* note 57.

[351] The Protection of Plant Varieties and Farmers' Rights Act, 2001 of India. Art. 39(1)(i).

[352] Under the terms of the Act, extant varieties include those which (1) have been notified under the Seeds Act of 1966; (2) are farmers' varieties; (3) are varieties about which there exists common knowledge; or (4) are any other variety which is in the public domain. The Protection of Plant Varieties and Farmers' Rights Act, 2001 of India. Art. 2(j).

[353] Specifically, testing for distinctness, uniformity, and stability for new varieties involves undergoing field trials in which the variety's characteristics are compared with those of a suitable reference variety over two growing seasons in two locations. For farmers' varieties, testing is only required for one season in two locations. Agrawal, R. C. (2019, forthcoming). Opportunities and Challenges Created by Plant Variety Protection and Farmers' Rights Act in India. In K. Adhikari & D. J. Jefferson (eds.) *Intellectual Property Law and Plant Protection: Challenges and Developments in Asia*. Abingdon, UK: Routledge.

[354] *Id*.

Farmers who choose to register new plant varieties are entitled to the same set of rights as any other breeder. Additionally, the Indian Act also establishes a specific set of "farmers' rights" in relation to all types of plant varieties that the law recognises. These include the guarantee that farmers can save, use, sow, re-sow, exchange, share, and sell their farm produce, except in branded form.[355] Farmers – both as individuals and at the community level – are also entitled to compensation if several situations occur. These include if after propagation, a registered new variety fails to perform as expected,[356] or where a village or local community has contributed significantly to the evolution of a variety registered by a third party under the Act.[357]

The Indian legislation also institutes other protections for farmers, such as shielding them from innocent infringement of plant breeders' rights,[358] and exempting them from paying all fees associated with legal actions brought under the Act.[359] Furthermore, the Indian Act establishes systems related to accessing plant genetic resources and negotiating equitable benefit sharing that are consistent with the Nagoya Protocol and the Plant Treaty. For instance, the law creates a national Gene Fund, which is responsible for managing benefit sharing where farmers provide essential inputs resulting in new or essentially derived varieties that third parties register for protection.[360] The Indian regime also requires disclosure of the source of any genetic material used for the development of a new variety, where the material has historically been conserved by particular tribal or rural communities.[361]

Given these various provisions, the Protection of Plant Varieties and Farmers' Rights Act of India offers a model for how a unified legal framework can regulate plants as intellectual property while simultaneously providing mechanisms through which other national goals may be achieved. The Indian law is expressly concerned with issues that are germane not only to the TRIPS Agreement, but also to the Convention on Biological Diversity, the Plant Treaty, and the Nagoya Protocol. Furthermore, although India is not a member of UPOV, there are reasons to believe that a similar

[355] The Protection of Plant Varieties and Farmers' Rights Act, 2001 of India. Art. 39(1)(iv).
[356] *Id*. at Art. 39(2).
[357] *Id*. at Art. 41.
[358] *Id*. at Art. 42.
[359] *Id*. at Art. 44.
[360] *Id*. at Art. 45(1)(a).
[361] *Id*. at Art. 40.

law, if developed by a UPOV 1978 signatory country, might be compliant with the terms of the Convention.

In fact, the original version of India's Plant Variety Bill was modelled on UPOV 1978, reflecting the country's intention to join the Union.[362] While it is true that prior to the enactment of the final law, the initial Bill was modified to incorporate a chapter on farmers' rights, the basic parameters of the intellectual property law for plant breeders were left unaltered. Subsequently, India made a formal request to join UPOV in 2002, one year after the Protection of Plant Varieties and Farmers' Rights Act was passed. At that time, the UPOV Secretariat apparently extended an oral offer to open an exception that would allow India to join the 1978 version of the Convention, which had formally ceased to accept new members in April 1999.[363]

An initial examination of the Indian legislation by the UPOV Consultative Committee began in October 2002 and resulted in a number of observations on the compliance of the law with the UPOV Convention. The communications between the Indian government and the Consultative Committee were never made public, and therefore it is difficult to ascertain whether a regime such as the Indian Act with UPOV 1978 would ever be formally recognised as compliant with the Convention. This is because negotiations between India and UPOV ceased in 2003 after the Indian non-governmental organisation Gene Campaign filed a public interest lawsuit that challenged the government's intention to join the Union.[364] Thus, it is unclear whether UPOV would consider a law such as the Indian Act to be consistent with the 1978 version of the Convention.

Nevertheless, the experiences of other non-UPOV countries may prove to be illustrative. For instance, in Malaysia a national *sui generis* intellectual property law for plants, the Protection of New Plant Varieties Act, was passed in 2004. This regime recognises the role that farmers and public sector institutions play in plant genetic improvement, and the law expressly permits farmers – individually or collectively – as well as local communities and indigenous groups to file applications for plant variety protection.[365] Meanwhile, although the plant varieties developed by professional

[362] Ranjan, P. (2009). Recent Developments in India's Plant Variety Protection, Seed Regulation and Linkages with UPOV's Proposed Membership. *The Journal of World Intellectual Property, 12*(3), 219-243: 231.
[363] Deere, *supra* note 72 at 109.
[364] *Id*.
[365] Protection of New Plant Varieties Act, 2004 of Malaysia. Art. 13(d).

breeders must meet the UPOV-based criteria of novelty, distinctness, uniformity, and stability in order to receive protection,[366] varieties that are bred, or discovered and developed by a farmer, local community, or indigenous group need only demonstrate novelty, distinctness, and identifiability.[367] The periods of protection for these two categories of varieties are different, in that breeders' varieties are granted exclusivity for twenty years, while farmers' varieties are limited to a period of fifteen years of protection.[368]

Furthermore, while the Malaysian Act does not incorporate an independent chapter on farmers' rights in the style of the Indian legislation, the Act does endeavour to establish protections for customary agricultural practices. Thus, the Malaysian regime stipulates that the rights granted to plant breeders do not extend to any act of propagation by small farmers using the harvested material of a registered variety on their own holdings. Furthermore, the exchange among small farmers of "reasonable amounts" of the propagating materials of intellectual property protected varieties is expressly permitted. Finally, the Malaysian Act allows for the sale of farm-saved seeds of protected varieties in situations where a small-scale farmer cannot utilise these seeds on his own holding due to natural disaster or emergency, or any other factor beyond the farmer's control.[369]

While these provisions institute many of the elements of the Plant Treaty, the Malaysian Act also contains language that is consistent with the terms of the Convention on Biological Diversity and the Nagoya Protocol. Thus, all applications for intellectual property in the form of plant breeders' rights must be accompanied by a disclosure of the source of origin of the genetic material, or the immediate parental lines of the variety under consideration. The required documentation must also include the written consent of the authority representing the relevant local community or indigenous group in cases where the variety was developed using the germplasm of local and native plant varieties.[370]

Although Malaysia is not a member of the UPOV Convention, in 2004 the country requested that the Union examine its Protection of New Varieties of Plants Act

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[366] *Id*. at Art. 14(1).
[367] *Id*. at Art. 14(2).
[368] *Id*. at Art. 32. Note that both categories of varieties are eligible for a period of protection of twenty-five years where the species in question is a tree or vine.
[369] *Id*. at Art. 31(1).
[370] *Id*. at Art. 12(1)(f).

for conformity with UPOV 1991. Generally, the UPOV Council found that the Malaysian law was consistent with the terms of UPOV 1991, incorporating "most of the substance of the 1991 Act."[371] However, with respect to the protection of farmers' plant varieties, the Council noted that "a separate system of protection is introduced which should be clearly distinguishable from the breeder's right."[372] Therefore, "it would be preferable to provide for a different name for this right and to deal with this separate system of protection in, for example, a new part of the Act."[373] This statement implies that UPOV would not object to the establishment of a mechanism for the protection of farmers' plant varieties in the same legal instrument as a UPOV-compliant plant breeders' rights regime, provided that the two categories of protection were clearly delineated.[374]

The experience of countries such as India and Malaysia demonstrate that it is possible to integrate additional national policy goals into intellectual property laws for plants. The legal frameworks of these two territories are mostly concerned with complying simultaneously with the obligation under the TRIPS Agreement to regulate plants as intellectual property, and with the commitments that they have assumed pursuant to the Plant Treaty. The Indian and Malaysian laws are also to a certain extent concerned with issues of access and benefit sharing as outlined in the Convention on Biological Diversity and the Nagoya Protocol.[375] Other countries have also sought to assimilate their national intellectual property laws with these goals.

Some scholars have suggested that laws conceptualising plants as intellectual property could also accomplish goals such as (1) rewarding farmers for the historical conservation and sustainable use of plant genetic resources, or (2) regulating access to these resources, via the establishment of a national Seed Fund.[376] Such a system could mandate that registrants for plant breeders' rights contribute to the Seed Fund, which would then be partially redistributed to the individual farmers or the communities

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[371] UPOV. Examination of the Conformity of the Protection of New Plant Varieties Act 2004 of Malaysia with the 1991 Act of the UPOV Convention. Document C(Extr.)/22/2. Twenty-Second Extraordinary Session of the UPOV Council (February 2, 2005). ¶50.
[372] *Id*. at ¶10.
[373] *Id*.
[374] Kanniah, R. (2019, forthcoming). Implementation of the Plant Variety Protection Laws of Indonesia, Malaysia and the Philippines: Trends and Future Prospects. In K. Adhikari and D. J. Jefferson (eds.). *Intellectual Property Law and Plant Protection: Challenges and Developments in Asia*. Abingdon, UK: Routledge.
[375] Note however that at the time of writing of this thesis, Malaysia was not a party to the Nagoya Protocol.
[376] Correa, *supra* note 8 at 64.

from which the germplasm used to develop the new variety was sourced.[377] The Seed Fund could also be used to support initiatives such as on-farm conservation of native and local plant varieties and the establishment of community seed banks.

One country that has experimented with embodying this idea in its domestic law is Thailand, which established a government-administered Plant Varieties Protection Fund in its 1999 Plant Varieties Protection Act. In general terms, the Thai legislation represents an attempt to balance multiple policy goals, including those related to offering intellectual property for plants and to regulating access and benefit sharing. The Thai Act is based on both the 1991 version of the UPOV Convention and the Convention on Biological Diversity. Thus, the regime attempts to give effect to the benefit sharing provisions mandated under the Convention on Biological Diversity and its Nagoya Protocol, in part via utilisation of the Plant Varieties Protection Fund.

The overarching purpose of this Fund is to support and subsidise activities related to conservation, research, and development activities for plant varieties that are registered under the national intellectual property law.[378] In addition to delimiting the parameters for access and benefit sharing in Thailand, the regime requires that plant breeders accept a profit-sharing agreement where a "general domestic plant variety" or a "wild-type plant variety" or any part thereof has been used as source material with which to breed a "commercial variety."[379] Furthermore, the Thai Act provides an assortment of additional measures that are intended to serve the interests of diverse stakeholders in the national agricultural sector, and in parallel to uphold multiple international obligations. These include instituting a variegated system of intellectual property for new, local domestic, general domestic, and wild plant varieties; providing a broad exemption to plant breeders' rights for farm-saved seed; and the requirement of disclosure of origin for the registration of new varieties.[380] Through these various measures, the Thai Act operates to synthesise various international agreements, including the UPOV Convention (intellectual property for plant breeders); the Convention on Biological Diversity and the Nagoya Protocol (access to genetic resources and benefit sharing); and the Plant Treaty (recognition of farmers' rights).

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[377] *Id*. at 61.
[378] Plant Varieties Protection Act, B.E. 2542 (1999) of Thailand, § 54.
[379] *Id*. at § 52.
[380] Lertdhamtewe, *supra* note 67.

Although the Thai Act is innovative in its attempt to amalgamate various objectives, the provisions related to the Plant Varieties Protection Fund have been criticised by commercial breeders and farmers' advocates alike. On the one hand, seed companies have argued that the Fund's profit-sharing requirement has discouraged investment in the generation of improved plant varieties in Thailand, and has hindered the development of the country as a "seed hub."[381] On the other hand, it has been reported that the Plant Varieties Protection Fund does not effectively distribute the income received through the access and benefit sharing requirements of the Act, leaving local farming communities inadequately compensated for their contributions.[382]

In part to address these criticisms, a draft amendment to the Thai Act was published in 2017. One of the key changes that this amendment proposed was that new plant varieties not based on existing Thai varieties (i.e., wild, local domestic, and general domestic varieties) would be exempted from the revenue sharing requirements that the Act currently mandates.[383] If enacted, this change could have the effect of limiting the number of varieties that are subject to the requirements of obtaining prior informed consent and negotiating mutually agreeable terms for benefit sharing. Nevertheless, it appears that if the draft amendment were passed, the Plant Varieties Protection Fund would continue to be utilised as a means to meet Thailand's obligations under the Convention on Biological Diversity and the Plant Treaty. Meanwhile, additional reforms that the amendment proposes would also bring Thailand into greater alignment with the UPOV Convention, of which the country is currently not a member.[384]

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[381] Prasertsri, P. (2017). "Thai Plant Variety Protection Act Amendment Update." United States Department of Agriculture Foreign Agricultural Service GAIN Report No. TH7147 (November 2, 2017). *Retrieved from* https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Thai%20Plant%20Variety%20Protection%20Act%20Amendment%20Update_Bangkok_Thailand_11-2-2017.pdf.

[382] Lertdhamtewe, P. (2014). Developing Country *Sui Generis* Options: Thailand's *Sui Generis* System of Plant Variety Protection. Quaker United Nations Office Briefing Paper No. 3. *Retrieved from* http://www.quno.org/sites/default/files/resources/QUNO%20Thailand%20-%20plant%20variety%20protection%20-%202014%20%281%29.pdf.

[383] Prasertsri, *supra* note 381.

[384] For instance, it has been reported that the Amendment would align the periods of protection for the breeder's right with UPOV 1991; introduce protections for essentially derived varieties; and restrict the farmers' privilege. Sujintaya, S. "First Draft Amendment to the Plant Varieties Protection Act." (23 January 2018). Insight, Baker McKenzie. *Retrieved from* https://www.bakermckenzie.com/en/insight/publications/2018/01/first-draft-amendment-plant-varieties/.

For its part, the 1978 version of the UPOV Convention is silent as to whether the establishment of a national Seed Fund as a mechanism to share benefits with farmers or local communities would be consistent with its system of plant breeders' rights. The only relevant provision of UPOV 1978 is Article 6(2), which states that the grant of protection may not be made subject to conditions other than novelty, distinctness, uniformity, stability, and denomination. However, payments into a Seed Fund could be structured as requirements for the *exercise* rather than the *grant* of plant breeders' rights. Thus, applicants would not be required to contribute to the Seed Fund as a condition for obtaining intellectual property protection. Instead, contributions would only need to be paid if the variety, once registered, were commercialised.

Overall, Option 1 represents a viable strategy for countries that are legally bound to the 1978 version of the UPOV Convention and that are also subject to additional international obligations, such as those contained in the Plant Treaty or in the Convention on Biological Diversity and its Nagoya Protocol. Legally unbound countries and territories that are only bound to the TRIPS Agreement could also consider the option of enacting unified legislation to both regulate plants as intellectual property and accomplish other national goals related to the governance of certain types of plants. Although to date no such unitary regime has been tested in a country that is a member of the UPOV Convention, the experiences of non-UPOV countries such as India and Malaysia are illustrative, given that their governments have communicated directly with the UPOV Council on matters related to compliance.

The following actions are recommended for countries that wish to follow Option 1:

- If the country is a member of the UPOV Convention, it should reinscribe the essential form of plant breeders' rights that the version of the Convention to which it is subject establishes;
- Furthermore, the country should:
    - Institute protections for customary agricultural practices such as exemptions from infringement of plant breeders' rights for saving, using, re-planting, multiplying, exchanging, and selling (in non-branded form) planting material obtained from protected varieties;

- Create a separate chapter in the law that would allow for the registration of different types of plant varieties, such as local and native landraces or wild-type plants;
- Establish a mechanism to regulate issues of access to plant genetic resources and equitable benefit sharing, for instance via a national Seed Fund.

Option 2: Parallel Laws

The second standardised option that countries could consider to govern the uses of different types of plants is to enact two separate frameworks. The first of these would recognise plants as intellectual property. Depending on a particular country's international obligations, this first law could reinscribe the UPOV-based system of plant breeders' rights, or adopt *sui generis* rationalities. Complementarily, the second regime would unify all of the other policy goals that a country considers relevant to the regulation of various types of plants. These could include, for example, protections for customary agricultural practices and traditional knowledge, incentives to promote the sustainable use and conservation of agrobiodiversity, mechanisms for access to plant genetic resources and equitable benefit sharing with resource providers, and food security or food sovereignty. The precise subject matter to be included in the non-intellectual property framework will also depend on whether a particular country is subject to obligations under the Convention on Biological Diversity, the Nagoya Protocol, the Plant Treaty, or some combination of the three.

For countries that are legally bound to the UPOV Convention, the first law that would be instituted under Option 2 is straightforward. That is, these governments would establish a framework that would be consistent with the version of UPOV to which they must adhere, taking advantage of the pertinent flexibilities provided in the Convention if so desired. Meanwhile, legally unbound countries or territories that are only subject to the TRIPS Agreement would have broader policy space. As such, these States could create locally tailored systems for the embodiment of plants as the subject matter of intellectual property, attending to the various considerations surrounding the conventional approaches discussed throughout Chapter 2.

While this thesis has already focused extensively on the first relevant law to be introduced according to Option 2 – that is, a framework for the regulation of plants as

intellectual property – the structure of the second type of law has not yet been fully explored. Given that this legislation would amalgamate provisions from the Convention on Biological Diversity, the Plant Treaty, and the Nagoya Protocol, it would need to incorporate various elements. These include protections for customary agricultural practices ("farmers' rights" in the parlance of the Plant Treaty), as well as a mechanism for access and benefit sharing. Although prior lawmaking projects have not generally considered these issues in a unified manner, some regional and national level initiatives provide insights.

One prominent example is contained in the African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources (the "African Model Law"). The development of this regime dates to the early 1990s, shortly after the conclusion of negotiations leading to the Convention on Biological Diversity. Early drafts of the African Model Law only dealt with issues of access and benefit sharing. Meanwhile, subsequent versions reflected the influence of international non-governmental organisations, because they also addressed concerns related to the protection of customary agricultural practices.[385]

These various influences resulted in the development of the African Model Law into a comprehensive template for the integration of a variety of policy goals that related to the subject matter covered by the Convention on Biological Diversity, the Plant Treaty, and the Nagoya Protocol. Subsequently, the Model Law further evolved such that when the Heads of State of the Organization of African Unity[386] finally endorsed the regime in 2000, it also contained a *sui generis* system to grant intellectual property to plant breeders. Thus, in its finalised form, the African Model Law also embodies a framework that would allow national governments to comply with the TRIPS Agreement.

The final text of the African Model Law includes several specific objectives. The first two of these are (1) to "recognise, protect, and support the inalienable rights of local communities including farming communities over their biological resources, knowledge, and technologies"; and (2) to "recognise and protect the rights of

[385] Zerbe, N. (2007). Contesting Privatization: NGOs and Farmers' Rights in the African Model Law. *Global Environmental Politics, 7*(1), 97-119, 110.
[386] This organisation was disbanded in 2002 by its last chairperson, South African President Thabo Mbeki, and replaced by the African Union.

breeders."[387] The regime conceives of these two primordial goals as complementary rather than mutually exclusive. Thus, in addition to providing a system of plant breeders' rights similar to the framework established in the UPOV Convention, the African Model Law grants a variety of protections related to customary agricultural practices.

Foremost, the African Model Law guarantees farmers' ability to save, use, exchange, and sell farm-saved seed or the propagating material of farmers' varieties, which are also eligible for registration.[388] Farmers are further permitted to use breeders' new plant varieties to develop farmers' varieties,[389] and to collectively save, use, multiply, and process farm-saved seed obtained from any variety protected under the framework.[390] However, farmers are prohibited from selling the farm-saved seed of protected breeders' varieties at industrial or commercial scales.

The African Model Law also guarantees the protection of traditional knowledge related to plant and animal genetic resources.[391] A further innovation of the regime is that it recognises that farmers' plant varieties and animal breeds are eligible for protection according to the customary practices and laws of the concerned local farming communities. The African Model Law allows for the enforcement of these customary norms independent of whether they have been formally codified in national legislation.[392]

In addition to relevant customary protocols, the African Model Law stipulates that the domestic laws of Member States must provide a form of "intellectual protection" for the plant varieties that farmers develop, in the form of a variety certificate. According to this system, farmers' plant varieties do not need to meet the criteria of distinctness, uniformity, and stability to be registered.[393] The conditions of the variety certificate entitle the community that owns the certificate to multiply, cultivate, use, sell, or license the protected variety exclusively, without prejudice to the rights of farmers from other communities.[394]

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[387] African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources ("African Model Law") (2000). Part I(a) and (b).
[388] *Id*. at § 26(1)(d).
[389] *Id*. at § 26(1)(e).
[390] *Id*. at § 26(1)(f).
[391] *Id*. at § 26(1)(a).
[392] *Id*. at § 25(1).
[393] *Id*. at § 25(2).
[394] *Id*.

The African Model Law also incorporates elements from the Convention on Biological Diversity and the Nagoya Protocol. Specifically, the regime entitles providers of genetic resources to obtain an equitable share of any benefits arising from the commercial use of plant and animal genetic resources.[395] Furthermore, the framework requires legal mechanisms to be developed at the national level for individual farmers and rural communities to participate in making decisions on matters related to the conservation and sustainable use of plant and animal genetic resources.[396]

The African Model Law thus represents an interesting example of how multiple policy goals related to the regulation of the access and use of different types of plants could be consolidated into a parsimonious legal framework. Since the regional endorsement of the African Model Law in 2000, however, the regime has largely stagnated. Some Member States of the Organisation of African Unity have incorporated certain provisions from the Model Law into national lawmaking projects, but the legislation has mostly been ignored.[397] Nevertheless, the initiative could provide an interesting template that countries could study, where there is motivation to enact a comprehensive law to meet the various obligations established in the Convention on Biological Diversity, the Plant Treaty, and the Nagoya Protocol.

However, it should be noted that many of the provisions included in the African Model Law would not be consistent with a UPOV 1991-based system of plant breeders' rights. This is largely due to the restrictions that this version of the UPOV Convention places on farm-saved seed. In contrast, it is unlikely that UPOV 1978 would limit the ability of its signatories to implement legislation inspired by the African Model Law. It is true that at the time when the African Model Law was adopted, the plant breeders' rights section was heavily criticised by UPOV, based on the contention that public interest issues (e.g., food security, community rights) "should be separated from the commercial rights of breeders."[398] Nevertheless, this statement indicates that separation of these "public interest issues" from the system for granting proprietary

[395] *Id*. at § 26(1)(b).
[396] *Id*. at § 26(1)(c).
[397] De Jonge, B. (2014). Plant Variety Protection in Sub-Saharan Africa: Balancing Commercial and Smallholder Farmers' Interests. *Journal of Law and Policy, 7*(3), 100-111: 103.
[398] Strba, S. I. (2017). Legal and Institutional Considerations for Plant Variety Protection and Food Security in African Development Agendas: Solutions from WIPO? *Journal of Intellectual Property Law & Practice, 12*(3), 191-205: 193.

rights to plant breeders could be a viable option for countries that are legally bound to the UPOV Convention.

In other words, it might be preferable for many countries to separate their obligations under the UPOV Convention to legislate systems for plant breeders' rights from other lawmaking priorities. In any case, whether or not governments are legally bound to the UPOV Convention, they could follow Option 2 by enacting two separate laws. One regime would recognise plants as intellectual property (whether or not according to the UPOV Convention model), while a second framework would govern a variety of other issues relevant to the regulation of the access and use of different types of plants. This latter law could include various provisions, such as:

- A mechanism for the registration of different types of plant varieties, including those which have been newly developed by individual farmers or rural communities, as well as local and native landrace varieties, and wild-type plants. This system of protection could be based on different criteria for the protection of different types of plants, and it could establish a distinct scope of protection for each category.
- Guarantees related to the use by farmers of the seed and other propagating material from intellectual property protected plant varieties for non-commercial purposes, including to save, use, re-plant, multiply, exchange, sell (in non-branded form),[399] and conduct further breeding. Ideally, these provisions would be reinforced by a broad farmers' privilege that would also be incorporated into the national plant breeders' rights legislation.
- Protections for traditional knowledge related to plant (and possibly animal) genetic resources for food and agriculture. Traditional knowledge rights could also extend to subject matter not related to agriculture. Protection could take the form of government-administered or community-based registries of traditional knowledge, as well as via mechanisms for prevention, enforcement, and sanctions for misappropriation.

[399] Note that UPOV 1991 countries would likely not be able to recognise the ability of farmers to exchange or sell protected breeders' varieties, pursuant to the terms of the optional exception articulated in UPOV 1991 Article 15.2.

- Rules governing access to genetic resources and equitable benefit sharing. If a country is legally bound to the Convention on Biological Diversity and its Nagoya Protocol or the Plant Treaty, then its domestic law should comply with these international obligations. Thus, protocols could be established for how to obtain free, prior informed consent from communities that manage relevant genetic resources; how to draft mutually agreeable terms for an access agreement; and how to negotiate the equitable sharing of both monetary and non-monetary benefits derived from the commercial exploitation of any plant genetic resources provided. The framework for access and benefit sharing could be partially structured around a national Seed Fund or Gene Fund, if desired.
- Specification of the means through which individual farmers in particular and rural communities in general could participate in decision-making on matters related to the conservation and sustainable use of resources that are important for food and agriculture. The relevant subject matter should include, at minimum, plant genetic resources, but it could also extend to other types of resources that are of significant concern for farmers, such as land or water. Procedures for participation in decision-making should include, at minimum, consultations prior to the enactment of any new law or regulation or the reform of existing regimes.

The standardised approaches to the regulation of plants as intellectual property described in Chapter 2 may be attractive options for lawmakers to consider. Indeed, certain territories such as India have already experimented with Option 1. Others, including Nepal and Sri Lanka, are currently undertaking similar efforts. As for Option 2, several countries have already implemented or are currently in the process of developing legislation to govern the uses of different types of plants, according to rationalities beyond plant breeders' rights. These regimes have been most commonly oriented around the regulation of access and benefit sharing in relation to plant genetic resources. In contrast, fewer examples exist of systems that would allow for the legal inscription or registration of different categories of plants, including those developed by farmers.

Although these standardised approaches to lawmaking may be interesting for lawmakers to consider, in practice it is probable that countries will regulate the various issues related to the uses of different types of plants in multiple independent legal frameworks. This may be explained by several factors. Foremost, as discussed throughout the thesis, the plant breeders' rights model – as embodied most prominently in the UPOV Convention – has come to dominate legal imaginaries for how countries regulate the ways that different actors may use plants. It is therefore likely that many governments will recapitulate recent trends, by continuing to enact intellectual property systems for plants based on the UPOV template, whether or not they are formal members of the Convention.

Furthermore, among lawyers, government officials, and scholars alike, there exists a general lack of comprehension about how the various approaches and legal obligations related to the regulation of different types of plants intersect, overlap, and diverge from one another. Few systematic studies – let alone pragmatic legal frameworks – exist as precedents to elucidate how various policy goals related to the uses of different types of plants might be successfully amalgamated. Therefore, it is likely that many countries will adopt a patchwork of laws and regulations, which may or may not be designed according to some common, centralised strategy. It is for these governments that the case study of Ecuador, analysed in Part 2 of the thesis, will be especially informative.

Part 2. Experimenting with Intellectual Property for Plants: The Case Study of Ecuador

Before delving into the Ecuadorian case study, it will be helpful to recall that the aim of this thesis is to explore the limitations and possibilities for the making of intellectual property laws for plants. Part 1 of the thesis has centred on characterising the various legal obligations related to the regulation of plants as intellectual property to which many countries are subject. Furthermore, Part 1 has described additional considerations that are relevant for the governance of different types of plants, including norms that have been embodied in legal frameworks outside of the realm of intellectual property. Following this global survey, Part 2 of the thesis recounts how experimentation with the regulation of plants as intellectual property has operated in one location, specifically Ecuador.

In recent years, Ecuador has designed an ambitious agenda aimed at legislative reform in several domains. One initiative, commonly referred to as the "*Ingenios* Act"[400] is organised around objectives that include redefining how knowledge is generated and transferred, and under what circumstances intellectual resources may constitute the subject matter of exclusive rights. The legal experiment embodied in Ecuador's *Ingenios* Act centres on re-imagining how intellectual property is conceived and protected, in service of a comprehensive national development agenda. Ecuador is one of the smallest and most densely populated independent nations in South America, with a population numbering some sixteen million. However, notwithstanding the diminutive size of the country, the reconfiguration of the national system for intellectual property governance, in addition to other areas of legislative reform relevant to the access and use of different types of plants, mean that Ecuador is an important site of analysis.

The Ecuadorian case study presented here is based on fieldwork conducted in Quito, the capital of Ecuador and seat of the country's government, from January through July 2016, and again in October 2018. However, it should be noted that my engagement with Ecuadorian institutions in general and the *Ingenios* project in particular began in 2013, when as a lawyer with the Public Intellectual Property

[400] In its enacted form, this law is known as the Organic Code for the Social Economy of Knowledge, Creativity and Innovation. Registro Oficial, Órgano del Gobierno del Ecuador. (2016). Código Orgánico de la Economía Social de los Conocimientos, Creatividad e Innovación. Año IV – No. 899.

Resource for Agriculture I worked on a two-year project with the Ecuadorian National Institute for Agricultural Research. I visited Ecuador twice during this period, in October 2013 and April 2014, when I collaborated closely with officials in the National Institute for Agricultural Research to develop an internal intellectual property policy. It was then that I first learned of the *Ingenios* project, which at the time was still undergoing internal revision at the Ecuadorian Intellectual Property Institute.

During fieldwork, I conducted semi-structured interviews in Spanish with approximately 40 individuals who had close connections to the *Ingenios* project. Interviewees included elected representatives in the National Assembly, directors of governmental and intergovernmental agencies – including the Ecuadorian Intellectual Property Institute and the National Secretariat of Higher Education, Science, Technology and Innovation – as well as attorneys working in the private sector, industry representatives, foreign diplomats, entrepreneurs, academic researchers and scientists, journalists, and leaders of civil society organisations that represent indigenous and rural communities. Multiple interviews were conducted with some of these individuals. Particularly helpful contacts included a former director of the Ecuadorian Intellectual Property Institute and other officials from the Institute (which later became the National Service for Intellectual Rights), who were collectively responsible for overseeing the development of drafts of the *Ingenios* Bill before the text was formally submitted to the National Assembly.

In addition to these interviews, I also had numerous informal conversations with actors involved in the making of the *Ingenios* Act as well as other national policies related to intellectual property, agriculture, and economic development. These dialogues occurred during frequent visits to the offices of government agencies including the Ecuadorian Intellectual Property Institute / the National Service for Intellectual Rights; the National Secretariat of Higher Education, Science, Technology and Innovation; the National Institute for Agricultural Research; the Ministry of Agriculture; and Yachay. This latter institution was founded in 2014 but it expanded substantially during the course of my fieldwork, growing to fit its designation as the national “City of Knowledge.” The purpose of Yachay was to operate as a government-sponsored hub for technological innovation and knowledge-intensive business development in the Imbabura province of Ecuador. While living in Quito in 2016, I

frequently travelled to the Yachay campus in Urcuquí, where I acted as a volunteer advisor for the Directorate of Intellectual Property and Technology Transfer.

My fieldwork in Ecuador also included participation in numerous events in Quito related to the formation of the *Ingenios* Act, as well as agricultural and economic development policy in general. These included debates about the *Ingenios* Bill that were hosted by private sector entities (e.g., software companies and law firms) and the public academic sector; conferences on issues related to intellectual property, agriculture, food security, and food sovereignty; and pre-legislative consultations with groups representing indigenous and rural peoples in the National Assembly. Representatives of the Ecuadorian Intellectual Property Institute were also present at many of these events, ostensibly to take the views expressed into consideration for the purposes of revising the text of the *Ingenios* Bill, which in 2016 was still under consideration in the National Assembly. I regularly sat with these representatives and spoke with them about the proposed revisions to the *Ingenios* text.

The theoretical framework of participant-observation informed the fieldwork that I conducted in Ecuador. This methodology involves immersion in a particular setting and interaction with social actors towards the end of "document[ing] 'practices,' those moments when belief and action come together."[401] As a participant-observer in Ecuadorian governmental, academic, and civil society institutions, I was interested to investigate practices related to the making of laws whose purpose is to regulate plants as intellectual property. More specifically, I wanted to witness instances in which actors involved in the lawmaking process made decisions about the form that intellectual property for plants would take. I sought to document how these individuals theoretically and textually reconciled a variety of external and internal pressures that surrounded the making of the new law, and the assumptions that they made when thinking about intellectual property for plants.

Anthropologists generally accept the idea that there is no absolute correct way to balance participation and observation in ethnographic research.[402] Consistent with this notion, my fieldwork involved continuous navigation of a continuum between proximity and distance. The conversations that I had in government offices and

[401] Luker, K. (2008). "Field (and Other) Methods." In *Salsa Dancing into the Social Sciences: Research in an Age of Info-Glut.* Cambridge, USA: Harvard University Press. pp. 158.
[402] Musante, K. (2014). Participant Observation. In Bernard, H. R. & Gravlee, C. C. (eds.). *Handbook of Methods in Cultural Anthropology*. Lanham, USA: Rowman & Littlefield. pp. 262.

legislative chambers in Quito and Urcuquí oscillated between articulations of abstract concepts and concrete exercises. Generally, discussions centred on the language that could be incorporated into legal texts such that Ecuador would fulfil its obligations under the TRIPS Agreement and the UPOV Convention, while simultaneously effectuating the goals of protecting other national interests such as customary agricultural practices and agrobiodiversity. In addition to these external factors, I frequently discussed with interviewees certain internal dynamics that shaped the form of intellectual property for plants that was embodied in the final version of the *Ingenios* Act. The notes that I compiled through interviews and participant-observation in Ecuador during the making of the *Ingenios* Act have informed the analysis presented throughout Part 2 of this thesis.

Chapter 3. The Making of a New Ecuadorian Intellectual Property Law

In 2014, the National Secretariat of Higher Education, Science, Technology and Innovation of Ecuador announced that it was launching a project to formulate a new "Organic Code for the Social Economy of Knowledge, Creativity, and Innovation" (a/k/a the "*Ingenios* Act," roughly translated as the Ingenuity Act).[403] The *Ingenios* Act was passed in October 2016, following the approval of a significant majority of the National Assembly,[404] and the final version of the text was published in the Ecuadorian Official Registry of Laws in December 2016. The *Ingenios* Act had not yet been fully implemented as of 2018. However, a presidential decree establishing a general regulatory framework was emitted in May 2017,[405] and the National Service for Intellectual Rights was in the process of drafting the technical regulations as of late 2018.

The framework of the *Ingenios* Act encompasses four broad sections (called "Books" in the Act), comprising (1) the creation of a national system for science, technology, innovation, and ancestral knowledge; (2) provisions on "responsible research" and "social innovation"; (3) norms for the management of knowledge (including the various forms of intellectual property); and (4) financing and incentives for the national system of science, technology, innovation, and ancestral knowledge. Taken together, these components represent a comprehensive attempt not only to recreate Ecuador's national legal framework for intellectual property, but also to redefine how intellectual property intertwines with other public initiatives, such as those governing higher education, research, innovation, and entrepreneurship.

The project to restructure the Ecuadorian intellectual property system is far from a conventional or formulistic attempt at legal reform. Rather, it is the culmination of a series of social, cultural, political, and geopolitical tensions that have been unfolding at the national, regional, and global levels over the past several decades. As such, to understand the breadth of Ecuador's intellectual property experiment requires a review of the socio-legal history of the country in particular and the Andean region generally.

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[403] Código Orgánico de la Economía Social de los Conocimientos, Creatividad e Innovación del Ecuador. (9 de diciembre de 2016). Registro Oficial No. 899. (hereafter "*Ingenios* Act").
[404] *Asamblea aprobó el Código Ingenios*, EL COMERCIO (11 October 2016), *retrieved from* http://www.elcomercio.com/tendencias/asambleanacional-aprobacion-codigoingenios-debate-votacion.html (accessed 13 October 2016) (noting that the *Código Ingenios* was approved with a vote count of 88-22, with one abstention).
[405] Reglamento General al Código Orgánico de la Economía Social de los Conocimientos, Creatividad e Innovación. Decreto Presidencial No. 1435. (23 de mayo de 2017).

Of fundamental importance is a comprehension of how Ecuadorian lawmakers, embedded in this context, sought to restructure certain dynamics, including relationships between customary and industrialised agriculture, between local and international markets, and between modern scientific and traditional forms of knowledge.

3.1. Contextualising the Ecuadorian Case Study

The political history of Ecuador throughout the twentieth century was fraught with instability.[406] Several successive military regimes ruled the country between the 1960s and 1979, at which point Ecuador reinstated a constitutional democratic system. However, the return to democracy did not secure stability in the country, with continued unrest attributable in large part to economic issues. By 1998, the devastating environmental effects of the El Niño climactic phenomenon coupled with the precipitous fall in global crude oil prices led Ecuador to declare bankruptcy, which in turn provoked skyrocketing inflation. In 2000, President Jamil Mahaud converted Ecuador's currency to the United States dollar, which resulted in further price increases. Subsequently, Mahaud's successor President Gustavo Noboa imposed tough austerity measures, and concurrently several of the largest banks in the country collapsed.

In the meantime, various social movements began to coalesce in the early 2000s, comprised of groups that demonstrated in protest of fiscal austerity policies and governmental corruption, and in favour of the need to better recognise the rights of indigenous and traditional ethnic communities. In 2006, Rafael Correa was elected to the Presidency as a representative of the newly formed "Country Alliance" (*Alianza País*) party. One of Correa's most significant campaign promises was to reform the Ecuadorian Constitution comprehensively. Correa upheld this promise and a new

[406] The information presented in this section on the political rise of Rafael Correa as President of Ecuador under the banner of the Citizen's Revolution has been culled from various sources including a book written by Correa himself. Correa, R. (2012). *Ecuador: De Banana Republic a la No República*. Quito, Ecuador: Debate. Other relevant sources include Becker, M. (2011). *Pachakutik Indigenous Movements and Electoral Politics in Ecuador*. Lanham, USA: Rowman & Littlefield; Morales López, E. (2012). El Discurso Político de Rafael Correa (Presidente de Ecuador), *Tonos Digital,* 23.

Constitution was drafted in 2007, with significant popular participation via a national Constituent Assembly.

The new Constitution, which the National Assembly enacted in 2008, mandated that a fresh wave of general elections be conducted in 2009. Correa, capitalising on the popularity of the 2008 Constitution, was elected again. He was then re-elected to a second consecutive term in 2013, which ended in May 2017. Subsequently, voters chose Correa's former Vice President, Lenín Moreno, by a narrow margin in the 2017 election to lead the country until 2021. The present moment thus represents the longest period of democratic political stability in Ecuador in recent history. Indeed, prior to the Correa presidency, the country had witnessed the arrival and departure of seven heads of state in ten years.

At the time when he first took office, President Correa and the new political movement that he ushered into power, the "Citizens' Revolution" (*Revolución Ciudadana*), represented a departure from traditional Ecuadorian politics. Prior to his first election, Correa had been a relative outsider to the national political arena. Although he had briefly held the position of Minister of Economy and Finance under President Alfredo Palacio, Correa had not occupied any other prominent political office. He was relatively young, from a middle-working class background, educated, with scholarship support, in universities in the United States and Europe. Although Correa did not himself grow up in an indigenous community, he appeared to understand rural poverty and he spoke Quichua, the most common indigenous language in Ecuador.

Politically, Correa described himself as a "moderate leftist," who advocated for "twenty-first century socialism."[407] This theory, which will be discussed in detail in later sections of the thesis, envisages a social structure that privileges human needs over financial capital, but that does not completely abandon free market capitalism. This new model for socialism has been described as centring around four essential "axes," which are (1) sustainable use of nature; (2) privileging use value over exchange value; (3) democracy; and (4) multiculturalism.[408] During the decade when Correa held the

[407] Gualdoni, F. (1 de octubre de 2007). "Correa dirige a Ecuador hacia el 'socialismo del siglo XXI' de inspiración chavista." El País. *Retrieved from* https://elpais.com/diario/2007/10/01/internacional/1191189611_850215.html.
[408] Houtart, F. (2009). Socialismo del Siglo XXI: Superar la Lógica Capitalista. In A. Acosta & E. Martínez (eds.). *El Buen Vivir: Una Vía para el Desarrollo*. Quito, Ecuador: Ediciones Abya-Yala.

presidency in Ecuador, these concepts were officialised and variously inscribed in numerous new national laws and policies.

The 2008 Constitution itself embodies many of the ideals that are associated with twenty-first century socialism, while also borrowing certain concepts and values from indigenous Andean cosmologies. The new regime consciously rejects prior Latin American and European constitutional models as colonialist. For instance, critics of previous Ecuadorian governments claimed that the internationalisation of Ecuadorian economy under the 1979 and 1998 Constitutions resulted in the reduction of national sovereignty while reinforcing "Western/modern/capitalist/liberal culture."[409]

Popular repudiation of the 1998 Constitution was galvanised through the construction of an "emancipatory social consciousness" in Ecuador, a process in which a great diversity of actors participated.[410] The success of the constitutional reform in 2008 – and indeed, of the Citizens' Revolution itself – is attributable at least in part to the collaboration of stakeholders who had not typically worked together in the past. Thus, during the making of the new Constitution, peasant (*campesino*[411]) and indigenous peoples' organisations found advocates from an array of backgrounds, including scholars, urban professionals, feminist groups, social leaders, old guard politicians, the Ecuadorian military, and university students.[412]

Notwithstanding the multiplicity of social actors involved, the mobilisations spearheaded by indigenous and peasant activists were among the most important drivers that motivated the foundation of the Citizens' Revolution and the making of the 2008 Constitution. Civil society organisations including the Confederation of Indigenous Nationalities of Ecuador coordinated actions including street marches and protests, as well as participation in national politics to challenge the neoliberal economic and social reforms that were adopted throughout the 1990s.[413] An issue that united diverse indigenous peoples' and peasant movements was opposition to the

[409] Fernández, B. S., & Puente, F. (2012). Configuración y Demandas de los Movimientos Sociales Hacia la Asamblea Constituyente en Bolivia y Ecuador. *Iconos, Revista de Ciencias Sociales, 44*.
[410] Martínez Dalmau, R. (2009). El Proyecto de Constitución de Ecuador, Ejemplo del Nuevo Constitucionalismo Latinoamericano. *Revista del Instituto de Ciencias Jurídicas de Puebla, 23*, 264-274: 269.
[411] In the context of Ecuadorian agriculture, the term *campesino* can be most accurately translated as peasant or rural folk. However, for the purposes of this thesis I will use the word *campesino* to interchangeably mean both peasant and smallholder farmer.
[412] *Id*.
[413] Becker, M. (2011). Correa, Indigenous Movements, and the Writing of a New Constitution in Ecuador. *Latin American Perspectives, 38*(1), 47-62.

"agroexport" model that the 1979 and 1998 Constitutions installed in Ecuador. This system was criticised for prioritising the allocation of public resources to support industrial agriculture, which opponents claimed marginalised smallholder farmers and customary agrarian practices.[414]

Prior to the organisation of the 2007 Constituent Assembly during which the 2008 Constitution was drafted, movements demanding greater rights for rural peoples gained increasing visibility in national politics. This recognition was further catalysed through the promotion of *"buen vivir*," a concept that incorporated a series of *campesino* demands including those related to land and water rights, biodiversity protections, and food sovereignty. *Buen vivir,* translated as "good living" or "living well" – in contradistinction to "living better" – is a notion derived from indigenous Andean cosmologies in which human beings interact collectively and harmoniously with each other and with nature.

Buen vivir became a key motivation for the constitutional reformation process that was undertaken during the 2007 Constituent Assembly. Alberto Acosta, the Ecuadorian economist who served as President of the Constituent Assembly, advocated for the inclusion of the concept in the 2008 Constitution to make explicit the intention to abandon the then-reigning orientation towards development through neoliberal economic policies.[415] Subsequently, and throughout the Correa presidency Ecuadorian lawmakers repeatedly invoked *buen vivir* as an "ordering paradigm" that criticised standard international conceptions of development and economic growth and declared that such objectives should be checked by newly constitutionalised rights designed to protect marginalised groups, including smallholder farmers and indigenous peoples.[416] In this context, *buen vivir* may be understood as a "complex, not lineal concept"[417] that was translated from indigenous cosmology to official doctrine in Ecuador.

In addition to the political dynamics that have embroiled Ecuador in recent history, economic shifts in the country provide an important backdrop to the *Ingenios*

[414] Rosero, F., Carbonell, Y., & Regalado, F. (2011). Soberanía Alimentaria, Modelos de Desarrollo y Tierras en Ecuador. *Quito, CAFOLIS, FES/ILDIS, OXFAM, UPS*.
[415] Becker, *supra* note 413.
[416] Gudynas, E. & Acosta, A. (2011). La Renovación de la Crítica al Desarrollo y el Buen Vivir como Alternativa. *Utopía y Praxis Latinoamericana, 16*(53).
[417] Domínguez, R. & Caria, S. (2014) La Ideología del Buen Vivir: La Metamorfoses de una "Alternativa al Desarrollo" en Desarrollo de Toda la Vida. *Pre-textos para el Debate*, No. 2. Quito: Universidad Andina Simón Bolívar, pp. 26.

experiment. Over the past century, various models for the interaction between the State and markets proliferated across the Andean region. These have included at least three distinct "moments," including: "progress" or modernisation based on the extraction and exportation of raw materials; industrialisation overseen and directed by the State; and market reforms since the foreign debt crisis of the 1980s.[418] Each of these eras was based on a different perception of the appropriate level of interventionist involvement that the State should have in the economy. On one hand, structuralism proposed an active role of the national government in regulating agriculture, industrialisation, social security, and the labour market. On the other, neoliberalism – with policies synthesized under the paradigm of the "Washington Consensus"[419] – advocated for *laissez-faire* governmental policies, privatisation, and market self-regulation.

However, in Ecuador neither structuralism nor neoliberalism was able to overcome the country's historical model of "dependent integration into the global economy."[420] Thus, notwithstanding various attempts at national economic and fiscal reform, Ecuador's participation in global markets has traditionally relied on exporting raw commodities with little value added, the prices for which are subject to market fluctuations and demand. In an attempt to upend this dynamic, the Citizens' Revolution government under the Correa administration propounded a strategy of "sovereign and competitive integration into the world market."[421] This approach involved the rejection of many bilateral and regional free trade agreements, a deliberate transition towards a service-based economy, and the generation of scientific and technological capacity, as a departure from the extraction and exportation of natural resources.

The general vision of the Citizens' Revolution strategy was outlined in the 2008 Constitution, which some scholars have lauded as a "legal-political manifestation of the creative intent of the Ecuadorian people," and a contrast to the predominant

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[418] Falconí, F. & Oleas-Montalvo, J. (2016). Citizens' Revolution and International Integration: Obstacles and Opportunities in World Trade. (V.J. Furio, tr.) *Latin American Perspectives, 43*, 124-142.
[419] *See* Williamson, J. (2009). A Short History of the Washington Consensus. In N. Serra & J. E. Stiglitz (eds). *The Washington Consensus Reconsidered: Towards a New Global Governance*. Oxford, UK: Oxford University Press (describing the original 10 principles behind the Washington Consensus).
[420] Falconí & Oleas-Montalvo, *supra* note 418 at 128.
[421] *Id*. at 131.

historical Latin American model of non-democratic ("*crillo*") constitutionalism.[422] At its best, the new Constitution "affirmed national and popular sovereignty, strengthened the State, reformed the political system, and introduced a new model of development."[423] One important aspect of the 2008 Constitution is the legitimation of opposition groups, which have "gone from being opponents *of the constitution* to being *political* opponents."[424] Thus, the new Constitution intends to break the historical influence of elite interest groups in Ecuadorian politics, meanwhile recognising new categories of rights and installing novel procedures for popular participation in constitutional and legislative reform.

Among the most significant new rights that the 2008 Constitution grants are the "fundamental and irrevocable human right to water" (Art. 12); the "right to secure and permanent access to healthy, sufficient, and nutritious food" (Art. 13); the "right to live in a healthy and ecologically balanced environment" (Art. 14); the right of persons to "construe and maintain their proper cultural identity" (Art. 21); and, perhaps most innovative of all, the express recognition of nature as "subject of those rights which the Constitution recognises." (Art. 10). This provision effectively transforms nature from functioning as an "*object* of rights assigned by human beings to a *subject* of rights and therefore possessed of intrinsic value."[425] However, since nature is unable to enforce these rights on its own behalf, the Constitution delegates this responsibility to the State.[426]

The 2008 Constitution also represents a significant shift away from the framework established under previous Ecuadorian constitutional models in matters related to customary and small-scale agriculture, including access to seeds and other planting material. The paradigm that the former 1998 Constitution promoted included "the right to a quality of life that assures health, food and nutrition […]." This model obligated the State to "guarantee the right to health, the promotion and protection thereof, by means of the development of food security."[427] However, the provisions of

[422] Martinez D., R. (2016). Democratic Constitutionalism and Constitutional Innovation in Ecuador: The 2008 Constitution. (V.J. Furio, tr.) *Latin American Perspectives, 206*, 158-174: 160.
[423] Ortiz, S. (2011). 30-S: La Vulnerabilidad del Liderazgo de la Revolución Ciudadana y de la Institucionalidad en Ecuador. *Íconos: Revista de Ciencas Sociales, 39,* 25-34: 26.
[424] Martinez, *supra* note 422 at 163 (emphasis in original).
[425] Martinez, *supra* note 422 at 170 (emphasis in original).
[426] Basabe-Serrano, S. (2009). Ecuador: Reforma Constitucional, Nuevos Actores Políticos y Viejas Prácticas Partidistas. *Revista de Ciencia Política, 29*, 381-406.
[427] Constitución de la República del Ecuador de 1998, Art. 20; Art. 42.

the 1998 Constitution did not consider where, by whom, and through what means food is produced.

In contrast, the 2008 Constitution embraces the idea of "food sovereignty" as "a strategic objective and an obligation of the State to guarantee that persons, communities, peoples and nationalities *permanently achieve self-sufficiency* surrounding healthy and culturally appropriate foods."[428] This new constitutional model conceptualises food sovereignty as independence or self-reliance surrounding the production of and access to food, which implies broad access to seeds and other planting material. The language related to food sovereignty in the 2008 Constitution was developed through the direct engagement of peasant and indigenous peoples' organisations in the 2007 Constituent Assembly, during which groups such as the National Federation of Peasant, Indigenous, and Black Organisations and the Unitary Confederation of Rural Social Security Associations participated in numerous debates and round table discussions.[429]

The promotion of peoples' autonomy over local systems of food production is reinforced by the recognition in the 2008 Constitution of "the right to the secure and permanent access to healthy, sufficient and nutritious food; *preferentially produced at the local level and in correspondence with [peoples'] diverse identities and cultural traditions*."[430] Additionally, the 2008 Constitution enumerates a series of government obligations designed to realise the goals of food sovereignty by fostering self-reliance. These include, among other objectives, to promote smallholder production; to avoid the dependence on food imports; to promote the preservation and recovery of national agrobiodiversity and ancestral knowledge; and to ensure the free use, saving, and exchange of seeds.[431]

Given the breadth of the reforms that the new constitutional regime undertakes, numerous subordinate legal frameworks have been subject to revision following the enactment of the 2008 Constitution. Many of these laws have been expressly designed to address the guarantees that the new Constitution enshrines surrounding issues of interest to indigenous and other *campesino* peoples in Ecuador, including small-scale farmers. For instance, a new Law for the Food Sovereignty Regime was passed in

[428] Constitución de la República del Ecuador de 2008, Art 281 (emphasis added).
[429] Peña, K. (2016). Social Movements, the State, and the Making of Food Sovereignty in Ecuador. *Latin American Perspectives, 43*(1), 221-237.
[430] Constitución de la República del Ecuador de 2008, Art 13 (emphasis added).
[431] *Id*. at Art. 281.

2009. This legislation was designed to ensure that "the State will comply with its obligation and strategic objective of permanently guaranteeing to persons, communities, and peoples the self-sufficiency of healthy, nutritious and culturally appropriate food."[432] The new food sovereignty law established a series of governmental objectives including to promote sustainable food production; promote the association of small and medium producers to improve conditions in the production, storage, transformation, conservation, and commercialisation of food; incentivise the consumption of healthy, nutritious, and organic food; and promote democratic participation in lawmaking surrounding food sovereignty.[433]

The Law for the Food Sovereignty Regime also created the quasi-governmental Plurinational and Intercultural Conference for Food Sovereignty ("COPISA" for its Spanish acronym). The purpose of this institution is to generate and manage debate towards the formation of new laws and policies related to agricultural production in Ecuador, through continuous engagement with civil society actors. Towards this end, COPISA was instrumental in drafting a bill that was eventually modified and enacted as the 2017 Law for Agrobiodiversity, Seeds, and the Promotion of Sustainable Agriculture. This law will be discussed in detail in Chapter 4 of the thesis, but it is worth mentioning here that the principal objectives of the framework include to

> "[E]nsure the production, free and permanent use of seeds of quality and variety, through the promotion, scientific investigation and regulation of models of sustainable agriculture; respecting the diverse identities, knowledge and traditions for the end of guaranteeing the self-sufficiency of healthy, diverse, nutritious and culturally appropriate foods to achieve food sovereignty and contribute to *Buen Vivir*" (Art. 1).

Taken together, the Law for the Food Sovereignty Regime and the Law for Agrobiodiversity, Seeds, and the Promotion of Sustainable Agriculture demonstrate that issues related to the governance of different types of plants have emerged as significant legislative priorities in Ecuador since the enactment of the 2008 Constitution. In a similar way, the new constitutional regime precipitated discussions over how to reform the country's intellectual property law in order that it would better align with the *buen vivir* philosophy institutionalised by the 2008 Constitution. In 2014,

[432] Ley Orgánica del Régimen de la Soberanía Alimentaria del Ecuador. Registro Oficial Suplemento 583 (5 de mayo de 2009). Art. 1.
[433] *Id*. at Art. 3.

the Ecuadorian National Assembly declared that the "intellectual property law promulgated in 1998 is not in harmony with the rights and guarantees established in the Constitution of the Republic of Ecuador."[434] The *Ingenios* project was formally launched immediately thereafter.

3.2. Aspirations Underlying the *Ingenios* Project

On its face, one of the most intriguing aspects of the *Ingenios* Act is its explicitly ideological language. The regime was designed to replace the 1998 Ecuadorian Intellectual Property Law because, according to the Preamble of the *Ingenios* Bill that was introduced in the National Assembly in June 2015, the former framework was "a hyper-privatist system of knowledge [management], in which solely the owners/merchants of the intellectual property corresponding to a few transnational monopolies have benefitted."[435] In contrast, the *Ingenios* Act "aims to radically modify the existing paradigms in the generation, use, utilisation, and distribution of knowledge, a public interest good."[436] The project was designed with the express intention to reconceptualise the meaning and purpose of intellectual property in the Ecuadorian context.

Rather than embodying a narrowly focused reform, the *Ingenios* Act proposed a significant expansion of the normative context in which intellectual property is conventionally situated. Thus, the experiment encompasses a transformation of the entire national intellectual property legal framework, while being only partially concerned with intellectual property. Instead, the *Ingenios* Act describes itself as an attempt to reformulate the Ecuadorian economy, basing economic growth on the production, distribution, and transfer of knowledge, an exercise in which intellectual property constitutes one of various tools to be employed. The philosophical roots of this project are grounded in the concept of the "social and solidary economy." This economic model may be defined as "a conception that endeavours to transcend the option between the capitalist market and the State as a central planner and regulator

[434] *Ingenios* Act, los Considerandos.
[435] *Id*.
[436] Código Orgánico de la Economía Social de los Conocimientos, Creatividad e Innovación (3 de junio de 2015), Draft submitted to the National Assembly (hereafter "the *Ingenios* Bill"). Oficio No. T. 7137-SGJ-15-418.

of the economy."[437] In other words, the hope was to establish an economic system that would break the dichotomy between free market capitalism and State-centric socialism or communism.

Additionally, the language used to frame the *Ingenios* project centred at least as much on redefining the terms of political engagement as it did on redrawing the boundaries of intellectual property. The idea was that in order to create a framework for a social and solidary economy based fundamentally on knowledge, democratic participation was required at all stages of legislative development. As an incarnation of this theory, the *Ingenios* Bill was drafted through a process of public scrutiny and feedback, and versions of the text were presented and debated in numerous community-level socialisation events, as well as online. The Ecuadorian officials responsible for the *Ingenios* project consciously analysed prior examples of the creation of "collaborative legislation" and "e-government," based on which they designed a system for citizen engagement.[438] This process will be discussed in greater detail below.

Given the significant political and economic intentions of the *Ingenios* Act, during the making of the law it was emphasized that the framework should be grounded in the 2008 Constitution. The Preamble of the *Ingenios* Act clarifies the relationship of the law with the new Constitution. This introduction cites the new constitutional right of persons "to enjoy the benefits of scientific progress and traditional knowledge."[439] Additionally, the Preamble quotes the 2008 Constitution, declaring that it is the State's responsibility "to facilitate and promote the incorporation of knowledge into society to achieve the objectives of the development regime; to promote the generation and production of knowledge, to foster scientific and technological research and empower traditional knowledge; [and] to ensure the diffusion and access to scientific and technological knowledge," in addition to other duties.[440]

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[437] Coraggio, J. L. (2011). *Economía Social y Solidaria: El Trabajo Antes Que el Capital*. Quito, Ecuador: Abya-Yala. pp. 43.
[438] *See* Terán, L., Spicher, N., Ramírez, R., Pazos, R., & Ron, M. (2016). Public Collaborative Legislation: A Case Study of the Ingenios Act. *2016 Third International Conference on eDemocracy & eGovernment* (Sangolquí, Ecuador, March 30, 2016 – April 1, 2016), pp. 87-92.
[439] Constitutión de la República de Ecuador de 2008, Art. 25.
[440] *Id.* at Art. 387.

The Preamble further invokes the constitutional prohibition of "all forms of appropriation of collective knowledge…and appropriation of genetic resources,"[441] while reaffirming the right of persons to "the protection of the moral and patrimonial rights to which they are entitled for scientific, literary, or artistic productions that they author."[442] Thus, the *Ingenios* Act endeavours to strike a balance by preventing certain subject matter from being privatised as intellectual property, while also ensuring that exclusivity may be granted in relation to other productions. Finally, the Preamble makes explicit the intention of the *Ingenios* Act to establish a "social economy of knowledge, creativity, and innovation" whose primordial focus is the creation of value through the "intensive application of the generation, transmission, management, and utilisation of knowledge as a public interest good."[443]

The objectives of the *Ingenios* Act are wide-ranging and ambitious, seeking to embody a manifestation of the intention of the 2008 Constitution to redefine the terms for economic and social participation for Ecuador as a nation and for Ecuadorians as individual and collective citizens. As articulated in the Act's Exposition of Motives, the new law endeavours to "generate instruments to promote an economic model that will democratise the production, transmission and appropriation of knowledge as a public interest good, thus guaranteeing the accumulation and redistribution of wealth in a manner that is just, sustainable and in harmony with nature."[444] Furthermore, the *Ingenios* Act aspires to "promote the development of science, technology, innovation and creativity to satisfy the needs and make effective the exercise of the rights of persons, peoples and nature."[445] The purpose of the Act is therefore to reify the political theory first crystallised in the new Constitution, particularly in relation to the democratisation of knowledge, equality and equity, and the promotion of individual and collective rights.

Another goal of the *Ingenios* Act is to codify the Indigenous Andean worldview (*cosmovisión*) of *buen vivir* as an alternative to what the makers of the law have described variously as neoliberal, Western, or Northern models of economic development. Since the 2008 Constitution was adopted, government officials have

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[441] *Id.* at Art. 322.
[442] *Id.* at Art. 22.
[443] Econ. Fausto Herrera Nicolade, Ministro de Finanzas, *Preámbulo al Código Ingenios* Oficio No. MINFIN-DM-2015 (June 2, 2015).
[444] *Ingenios* Act, Título Preliminar, Art. 3.1.
[445] *Id.,* Título Preliminar, Art. 3.2.

routinely cited *buen vivir* as the foundation of public policy and the guiding principle behind national development planning in Ecuador.[446] René Ramírez, the Minister of the National Secretariat of Higher Education, Science, Technology and Innovation during the presidency of Rafael Correa, described *buen vivir* as a "new pact of coexistence [that is formed] not only between members of the community, but between these persons and the environment."[447] This "new pact" seeks to reformulate the "productive matrix" of Ecuador, distancing the country from an economy based on exportation of commodities with little value added,[448] instead fomenting a pattern of specialisation grounded in knowledge, science, technology, and "social innovation," in conjunction with a strong policy of wealth redistribution.[449] In so doing, the hope was to reduce poverty and inequality, while simultaneously improving the quality of life for the Ecuadorian population and promoting environmental sustainability.

On its face, the language employed in the introductory sections of the *Ingenios* Act – as well as the characterisations of the law regularly provided by government officials – obviate the aspiration to reimagine the purpose of intellectual property in the Ecuadorian context. Even more ambitiously, the Act also endeavoured to redefine "development" and with it the total reconstitution of the national economic system. The enmeshment of intellectual property, development, and economics demonstrate that Ecuadorian lawmakers believed that by reconceptualising intellectual property – or at least by embedding intellectual property in a *buen vivir* framework – they could consequently reconfigure the economy. In so doing, the idea was to impel a development regime that "will have as objectives, among others, to improve the quality and hope of life, and to augment the capacities and potentialities of the population in the framework of the principles and rights that the Constitution establishes."[450]

One of the tenets of this "new pact" of *buen vivir* was to break the "cognitive dependency" that Ecuadorian officials believed that their country in particular and the

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[446] Caria, S. & Dominguez, R. (2016). Ecuador's *Buen Vivir*: A New Ideology for Development. *Latin American Perspectives, 206*, 18-33: 19.
[447] Ramírez G., R. (2014). *La Virtud de los Comunes: De los Paraísos Fiscales al Paraíso de los Conocimientos Abiertos*. Quito, Ecuador: Abya-Yala. pp. 30.
[448] According to data from the World Bank, as of 2018, the top five exports from Ecuador were (1) petroleum oils; (2) bananas; (3) frozen shrimps and prawns; (4) fresh cut flowers; and (5) prepared or preserved tuna. World Integrated Trade Solution. (n/d). Ecuador Trade at a Glance: Most Recent Values. *Retrieved from* https://wits.worldbank.org/CountrySnapshot/en/ECU (accessed 31 October 2018).
[449] *Id*. at 27.
[450] *Ingenios* Act, los Considerandos.

Andean region in general had experienced in relation to relatively wealthier States. Indeed, the Exposition of Motives of the *Ingenios* Act lamented, "our cognitive and technological matrix has been primarily dependent on the activities and goods produced in and by 'developed' countries."[451] According to the *Ingenios* Act, this dynamic was further compounded by the fact that the 1998 Ecuadorian Intellectual Property Law, through its "hyper-privatising system of knowledge," "has limited the possibility to innovate, and has been unable to attract foreign investment."[452]

Because of the global dynamics identified in the *Ingenios* Act and the express desire of the law to install a new development model in Ecuador, the vision of the new national intellectual property framework comprised several objectives. These included democratisation in the use and enjoyment of the benefits of knowledge, and achievement of the greatest efficiency possible in the coordination of activities to avoid duplication of efforts. Furthermore, as stated in the *Ingenios* Act, the existing technological gap that Ecuador experienced in relation to certain "central" countries should be diminished. Returning to the language of the 2008 Constitution, a final intention of the *Ingenios* Act was to "promote the generation of knowledge under an open, social, democratic and inclusive system, focused on human beings, in the development of their potential and the exercise of their rights, within the framework of respect for the rights of their peers and of nature."[453]

While the philosophy underlying the *Ingenios* Act contained many ambitious aspirations, some Ecuadorians expressed concern that the actual provisions of the law belied its rousing language. Critics speculated that the contemporaneous intentions to conceive of knowledge as a public interest good on the one hand and to guarantee the protection of private intellectual property on the other, could lead to an impasse and possibly even counterproductive outcomes.[454] Furthermore, it is notable that many of the more radical provisions of the *Ingenios* Bill were diluted or eliminated while the Ecuadorian National Assembly reviewed the project, through a series of political compromises.[455] These inside negotiations, coupled with the external

[451] *Ingenios* Act*,* Exposición de Motivos*.*
[452] *Id.*
[453] *Id.*
[454] *See, e.g.,* Partner attorney with an Ecuadorian intellectual property law firm. (25 February 2016). Personal interview; Partner attorney with an Ecuadorian intellectual property law firm. (16 February 2016). Personal interview; Attorney with an Ecuadorian university. (5 April 2016). Personal interview.
[455] *See* Director level official at the Ecuadorian Intellectual Property Institute (IEPI). (12 May 2016 and 6 July 2016). Personal interview.

pressures exerted by international obligations and forces internal to the Citizens' Revolution government, operated to temper the most progressive parts of early drafts of the *Ingenios* Bill. This process moderated the imaginaries that the law actualises, such that they tend to conform to the conventional logic of intellectual property.

Nevertheless, the manner in which the *Ingenios* Act was visualised, drafted, and publicised is itself unusual in the domain of intellectual property lawmaking. In an attempt to embody the "social innovation" that the project sought to foment, the *Ingenios* Bill was published on a Wikimedia site (called "WikiCOESC+i") shortly following its inception, with drafts regularly revised and uploaded for public review.[456] The Wikimedia platform was selected as a tool for collaborative development of the early versions of the *Ingenios* Bill based on its consistency with the "spirit" of the new law.[457] Officials touted the project as the first example of the collective construction of legislation in Ecuador, and as a space for "citizen encounter" through which the various proposals could be discussed in a cooperative, transparent, and democratic form. During the making of the law, the *Ingenios* Wiki page contained a video tutorial to raise awareness about the project, a list of aims, instructions for how to participate, and a link to create a user account.

Once registered with the Wiki site, during the drafting period users could make comments, ask questions about the text, or submit suggested alternative language. Contributions were intentionally anonymised based on the idea that de-identification was "a fundamental part of the right to freedom of speech and expression," which in turn was "inherent in the development of the democratic process."[458] However, one of the limitations of the Wikimedia platform was that users were only able to submit new comments to the draft *Ingenios* text, rather than respond to comments made by other users. This meant that dynamic debate was not possible between different users. Instead, a process of centralised curation was required, according to which comments

[456] *See* http://coesc.educacionsuperior.gob.ec/. Subsequent to the closure to the wiki page, a dedicated website was created to disseminate information about the *Código Ingenios*: http://www.ingenios.info.ec/.
[457] Terán, et al., *supra* note 438. The aspects of the Media Wiki platform cited as especially consistent with the spirit of the *Ingenios* Act are "licensing, development of free software and use of open access tools, familiarity of citizens with its use, and the thematic user interface (UI), specific interaction processes, among others." pp. 88.
[458] Terán, et al. *supra* note 438 at 89.

were compiled and then considered by the officials responsible for generating the draft law.[459]

Notwithstanding this technical limitation, the *Ingenios* Wiki page garnered broad visibility. As of 2018, the statistics on the site reported that it had received more than seven million views, with nearly fifty-thousand edits submitted during the drafting of the Bill.[460] According to officials involved with the project, eight versions of the *Ingenios* Bill were produced from the launch of the Media Wiki platform to the submission of the text to the National Assembly,[461] although only two drafts were made directly available on the Wiki page. After the *Ingenios* Act was passed, a dedicated website was created for the law,[462] on which several thematic videos were made available to explain how officials believe that the Act would address issues such as the protection of traditional knowledge, access to less expensive medications, and combating biopiracy.[463]

In addition to the formal online presence of the *Ingenios* Bill, social media was also leveraged as a means to complement the Wikimedia platform and to raise awareness about the project. Beginning in early 2014, officials from the National Secretariat of Higher Education, Science, Technology and Innovation and the Ecuadorian Intellectual Property Institute began to utilise platforms including Facebook and Twitter to "socialise" the *Ingenios* Bill. Manifestations of these initiatives included event announcements posted to the Facebook page of the Ecuadorian Intellectual Property Institute, as well as tweets released on the dedicated *Ingenios* project Twitter account.[464]

Likewise, numerous videos were uploaded to YouTube to explain the *Ingenios* project including clips entitled "What is the *Ingenios* Act?"[465] and "New *Ingenios* Act in Ecuador Seeks Productive Transformation."[466] Other videos featured members of the

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[459] Consultant from the FLOK Society involved with the making of the *Ingenios* Bill. (17 May 2016). Personal interview.
[460] *Ingenios* Wiki homepage, *retrieved from* http://coesc.educacionsuperior.gob.ec/index.php/C%C3%B3digo_Org%C3%A1nico_de_Econom%C3%ADa_Social_del_Conocimiento_e_Innovaci%C3%B3n. (accessed 31 October 2018).
[461] Terán, et al. *supra* note 438.
[462] *Ingenios* Act homepage, *retrieved from* http://ingenios.info.ec/. Note that as of 2018 this website has been taken down.
[463] Multimedia. *Ingenios* Act homepage, *retrieved from* http://ingenios.info.ec/videos. Note that as of 2018 this website has been taken down.
[464] @CodigoINGENIOS; #CambiamosLaHistoria; "We are changing history".
[465] Secretaría EduSuperiorEc. (19 March 2015). "Qué es el Código INGENIOS?" *Retrieved from* https://www.youtube.com/watch?v=hoeMQb_d8UE.
[466] TeleSUR TV. (4 June 2015). "Nuevo Código de Ingenios en Ecuador busca transformación productiva." *Retrieved from* https://www.youtube.com/watch?v=x1w_FNswObk.

National Assembly, the Director of the Ecuadorian Intellectual Property Institute, and President Correa. Finally, as the draft law wended its way through rounds of debates and pre-legislative consultations[467] in the National Assembly in late 2015 and early 2016, the Director of the Intellectual Property Institute and other governmental officials involved with the project participated in frequent live television and radio interviews, most of which were subsequently made available for viewing online.

These virtual marketing and engagement campaigns were replicated in numerous real-world events. During the making of the *Ingenios* Act, officials from the National Secretariat of Higher Education, Science, Technology and Innovation and the Ecuadorian Intellectual Property Institute convened more than five-hundred "sensitisation" (awareness-raising) talks in Ecuadorian universities, as well as debates and round-table discussions with key stakeholders from the public, private, and academic sectors. Importantly, when the officials who managed the Wikimedia platform realised that participants in the physical events were unlikely to submit comments online, they recorded citizens' observations during the proceedings and subsequently added them to the *Ingenios* Wiki page.[468]

Socialisation events related to the *Ingenios* Act also transcended Ecuadorian borders. For instance, the Director of the Intellectual Property Institute visited the Latin American Faculty of Social Sciences in Argentina on several occasions to speak about the *Ingenios* Bill and to solicit feedback about the project.[469] In 2016, the proposed law was discussed during conferences focused on innovation, the international patent system, and economic development at universities in Peru, Mexico, and Spain.[470] The

[467] The 2008 Ecuadorian Constitution requires that prior to the approval of a new law whose provisions could affect the collective rights of indigenous commues, communities, peoples, and nationalities and of the Afro-Ecuadorian and Montubio peoples, pre-legislative consultations must be conducted with these groups. Constitución de la República del Ecuador de 2008, Art. 57(17).
[468] Consultant from the FLOK Society involved with the making of the *Ingenios* Bill. (17 May 2016). Personal interview.
[469] Instituto Ecuatoriano de la Propiedad Intelectual. (3 de julio de 2015). "Código INGENIOS es acogido con éxito en Argentina." Boletín No. 29. *Retrieved from* https://www.propiedadintelectual.gob.ec/codigo-ingenios-es-acogido-con-exito-en-argentina/.
[470] Jefferson, D. J. (28 de junio de 2016). "Código Ingenios: La reconceptualización de la propiedad intellectual en la mitad del mundo." El Telégrafo. *Retrieved from* http://www.eltelegrafo.com.ec/noticias/sociedad/4/codigo-ingenios-la-reconceptualizacion-de-la-propiedad-intelectual-en-la-mitad-del-mundo.

Ingenios Bill was also included as a case study in a graduate research program focussed on investigating "cognitive capitalism" at the Sorbonne in France.[471]

Together, these occurrences amounted to significant popular influence of the *Ingenios* project, or at least the appearance thereof. Many Ecuadorian experts from the public and private sectors alike, whether in favour of or in opposition to the *Ingenios* Act have touted the awareness-raising efforts as impactful and generally positive. For instance, the drafting and revision process mobilised the participation of sectors of the Ecuadorian population that have been historically unfamiliar with intellectual property and its implications, such as indigenous and community groups, farmers, tradespeople, and artists.[472] Such participation was formalised through a process of pre-legislative consultations, in which members of indigenous and rural ethnic communities were invited to the National Assembly to share their perspectives about provisions of the *Ingenios* Bill that could impact them, such as how the law might affect customary agricultural practices and the protection of traditional knowledge. General public debates were also convened within the National Assembly, in which artisans, small-scale farmers, entrepreneurs, academics, and civil society representatives participated.

The motivations and objectives of the *Ingenios* initiative are expansive and complex, consolidating decades of social and political undercurrents, economic theory, and criticisms of the capitalist economic notions on which intellectual property laws are conventionally based. Meanwhile, the drafting and revision process involved significant popular participation. However, conversations with the officials and consultants involved with the making of the *Ingenios* Act suggested that the extent to which Ecuadorian citizens' comments directly influenced the final version of the law was probably limited. While all opinions and suggestions were considered, and although some resulted in changes to early drafts of the Bill,[473] the form that the final version of the law assumed was shaped predominantly by other factors. These included the international treaty obligations discussed in Part 1 of this thesis, in

[471] AndesInfo. (23 de junio de 2015). "Proyecto INGENIOS será objeto de estudio en La Sorbona de París." *Retrieved from* http://www.andes.info.ec/es/noticias/proyecto-ingenios-sera-objeto-estudio-sorbona-paris.html.
[472] *See, e.g.,* Civil society activist at the National Confederation of Peasant, Indigenous, and Black Organisations of Ecuador (FENOCIN). (3 May 2016). Personal Interview.
[473] Consultant from the FLOK Society involved with the making of the *Ingenios* Bill. (17 May 2016). Personal interview. Director level official from the Ecuadorian Intellectual Property Institute (16 April 2016). Personal interview.

addition to internal dynamics emanating from within the Citizens' Revolution government. The end result was a subtle transition from radical aspirations to relatively conventional legal imaginaries.

The making of the *Ingenios* Act began with ambitious goals, which manifested the reformist vision of a small group of Ecuadorian officials who believed that they could reimagine intellectual property in the national context. Their objectives are embodied in early drafts of the text, including the version of the *Ingenios* Bill that was formally submitted to the National Assembly in June 2015. The version of the *Ingenios* Act that was ultimately adopted still contains certain innovative aims, such as to "generate a pluralist and inclusive vision in the utilisation of knowledge, granting supremacy to use value over exchange value" and to "develop forms of property for knowledge compatible with *buen vivir*, [including] public, private, communitarian, state, associative, and mixed."[474]

However, the way that intellectual property was ultimately imagined in the *Ingenios* Act generally conform to the standard rationalities of individual possession, free market economic exploitation, and linear developmentalism. This trend is evident in the section of the law that grants rights to plant breeders, which essentially capitulates the rationality of the UPOV Convention, seeking to incentivise innovation in plant breeding and the commercial exploitation of new varieties. The system of intellectual property for plants that the *Ingenios* Act creates will be discussed in detail in Chapter 4. Meanwhile, the next section explores the various external and internal forces that affected the making of the law, including Ecuador's international obligations under the TRIPS Agreement, the UPOV Convention, and the 2016 free trade agreement with the European Union, as well as the policy agenda – both express and covert – of the Citizens' Revolution government.

3.3. Unpacking the *Ingenios* Act

One of the more surprising aspects of the *Ingenios* Act is the fact that much of the corpus of the legislation is devoted to subject matter outside of the traditional ambit of intellectual property. The title of the law – "The Organic Code for the Social Economy of Knowledge, Creativity, and Innovation" – itself suggests that the Act seeks to erect

[474] *Ingenios* Act, Art. 3(5) and 3(6).

a system that goes far beyond delimiting guidelines for protectable subject matter or enforcement procedures. Structurally, the law is divided into four "Books" covering an array of topics, including the establishment of a national system for science, technology, innovation, and ancestral knowledge; and the regulation of responsible research and social innovation. It is not until Book III of the law that both conventional – for instance, patents, copyrights, and trademarks – and experimental – taking the form of, especially, protections for traditional knowledge – intellectual property provisions are presented. Thus, the organisation of the *Ingenios* Act is an expression of the lawmakers' aspiration to transcend traditional narrow, techno-legal formulations of intellectual property, instead embracing a holistic approach that would contribute to the reconfiguration of the national economy.

Curiously, the *Ingenios* Act is simultaneously a rejection and a reaffirmation of the conventional conceptualisation of intellectual property as a catalyst for the achievement of economic goals. The *Ingenios* Act explicitly seeks to distance itself from orthodox development theories that are seen as being representative of Western notions of linear, market-oriented progress towards economic prosperity. Nevertheless, the project still embraces intellectual property as a tool for transforming the "productive matrix" of the Ecuadorian economy. One of the essential tenets of the regime is the notion that "intellectual property rights constitute an exception to the public domain of knowledge and they shall respond to the social function and responsibility in conformity with that which is established in the Constitution and the Law."[475] Such language has attracted the attention of critics of the *Ingenios* project, who believe that this notion undermines the prevailing international conception of the nature of intellectual property.[476]

The controversy seems to be largely related to the conflation of two distinct notions: first, that "knowledge is a public interest good" and second, that "intangible assets should be available to all, without restrictions, in the public domain." However, these assertions are not synonymous. Proclaiming that knowledge is a public interest good does not automatically situate intellectual resources – whether these are creative works, patented products or processes, or new varieties of plants – in the public

[475] *Ingenios* Act, Art. 82.
[476] *See e.g.,* Vela Descalzo, Ó. (17 de julio de 2016). "RIP Propiedad Intelectual." El Comercio, Opinión. *Retrieved from* http://www.elcomercio.com/opinion/propiedad-intelectual-codigo-ingenios-reneramirez.html.

domain. Furthermore, conceptualising knowledge as a public interest good does not exclude the possibility of granting private proprietary rights over subject matter that meets the requirements for protection that the law defines. There are many goods circulating in market economies that governments have classified as being in the public interest – for instance, medications or educational texts – but that still may be protected with intellectual property.

The confusion on the part of critics of the *Ingenios* Act may also result from the fact that, notwithstanding the Act's advocacy for the public domain, the law explicitly reiterates the importance of providing exclusive, proprietary rights to achieve certain goals. For instance, the *Ingenios* Act states, "intellectual property rights constitute a tool for the development of creative activity and social innovation."[477] This language reinscribes the narrative that many advocates for strong intellectual property protection have woven for decades, which the lawmakers who drafted the *Ingenios* Bill would likely consider to be representative of capitalist and neoliberal logics. At first glance, the tension between the desire to expand the ambit of the public domain and the expectation that private action can be strategically catalysed to achieve certain development goals may appear to be in opposition. However, this is one of the fundamental aspirations of the *Ingenios* project: to deconstruct the dichotomy between public domain and private rights.

The Common Dispositions of the *Ingenios* Act express the intention to balance public and private interests surrounding access to knowledge, such that "knowledge constitutes a public interest good, [and] its access shall be free."[478] However, the same sentence recognises the existence of exclusive, proprietary rights, as the free circulation of knowledge "shall not have more restrictions than those established in the Constitution, treaties and international instruments and the Law."[479] The reference to international legal frameworks may have been inserted into the text as a direct response to critics who had alleged during initial public debates and sensitisation events that certain passages of the *Ingenios* Bill could have violated Ecuador's treaty obligations, especially those imposed by the TRIPS Agreement.[480] Indeed, the law explicitly states, "nothing foreseen in this Code shall be able to be interpreted as

[477] *Ingenios* Act, Art. 84.
[478] *Ingenios* Act, Art. 4(i).
[479] *Id*.
[480] Partner attorney with an Ecuadorian intellectual property law firm. (16 February 2016). Personal interview.

contrary to the principles, rights and obligations established in [the TRIPS Agreement]."[481]

The Common Dispositions further set the basic terms of engagement with the new intellectual property system. Thus, "the acquisition and exercise of intellectual property rights shall ensure a balance between owners and users."[482] Likewise, Andean development philosophy is referenced, such that "the generation, transmission, management, use and utilisation of knowledge, creativity, technology, innovation, and traditional knowledge shall be oriented towards the realisation of *buen vivir*."[483] Other principles that underlie the *Ingenios* project include sovereignty over knowledge as a strategic objective of the State[484] and the prohibition on the privatisation of biodiversity and the country's genetic heritage, which are demarcated as property of the State that is "inalienable, perpetual, and unable to be encumbered."[485] Furthermore, the *Ingenios* Act recognises the "dialogue of knowledge [*diálogo de saberes*] as the process of generation, transmission and exchange of scientific knowledge and traditional knowledge,"[486] which is intended to reify the existence of a plurinational and intercultural State.[487]

Taken together, these passages reveal the ambition of the drafters of the *Ingenios* Act, and the desire to redefine numerous concepts that underlie contemporary social, political, and economic systems. Although the *Ingenios* Act claims to recalibrate the balance between public and private, and between owners and users of intellectual property, these appear to be secondary to other ends that the Act articulates. For instance, the law not only purports to redraw the boundaries of what is protectable knowledge, but also what constitutes knowledge itself. This redefinition is embodied in the decision to discuss "knowledges" in the plural (*conocimientos*). This word choice was intended to expand the scope of the subject matter that qualifies as intellectual property, while also manifesting the desire to exemplify the plurinational

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[481] *Ingenios* Act, Art. 4(ii).
[482] *Id.*
[483] *Ingenios* Act, Art. 4(v).
[484] *Ingenios* Act, Art. 4(vi).
[485] The concept of the "dialogue of knowledges" refers to the idea that a mutual exchange should be promoted between different knowledges and ways of knowing, which in the context of the present chapter may be understood as a dialogue between scientific or academic knowledge and the kinds of knowledge held and developed customarily by *campesinos*. Martínez-Torres, M. E. & Rosset, P. M. (2014). *Diálogo de Saberes* in La Vía Campesina: Food Sovereignty and Agroecology. *The Journal of Peasant Studies, 41*(6), 979-997.
[486] *Ingenios* Act, Art. 4(xvi).
[487] *Ingenios* Act, Art. 4(xix).

state to which the 2008 Constitution is committed to actualising. As the Exposition of Motives of the *Ingenios* Act notes:

> "[W]e must stress that the noun knowledges – in plural – in the name of the Act is not a mere coincidence. In effect, the Ecuadorian State has maintained a historical debt throughout its republican life: its institutions have stubbornly employed a European worldview, [and] in this manner, have made invisible any manifestation of knowledge or culture that does not enter into the positivist and Western canons."[488]

The bold framing language of the *Ingenios* Act imagines a system that would eradicate all remnants of European colonialism from the Ecuadorian territory, and in its place install a pluralist system of governance and economic exchange to unite cosmopolitan and "subaltern"[489] peoples. However, the *Ingenios* Act ultimately serves to justify centralisation rather than redistribution by situating the Ecuadorian State as the axis through which all knowledge-based transactions should flow. This phenomenon is suggestive of the tendency to "bring back the State" that has occurred in certain Latin America countries in recent years. Ramírez describes this as a strategy of "neosovereignty," which involves the "reconstruction of the nation-state dimension of public action and delineation of a regional political space."[490] Such an approach is epitomised in the preamble of the *Ingenios* Act, which, citing the 2008 Constitution, includes the desire to "guarantee national sovereignty, promote Latin American integration, and propel a strategic insertion into the international context."[491]

To actualise this aspiration, the *Ingenios* Act erects new State-based systems for the management of knowledge. The focus on "institutionalism" is manifest in the positioning of the National Secretariat of Higher Education, Science, Technology and Innovation – a single government agency – as the entity responsible for the regulation, administration, and enforcement of all subject matter related to higher education, science and scientific research, innovation, and technological development. The Secretariat is further empowered to define all national norms relating to intellectual

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[488] *Ingenios* Act, Exposición de Motivos, ¶8.
[489] In this context, the term "subaltern" relates to forms of knowledge or interpretations of the world that, de facto, are not considered viable or relevant epistemologies in the modern era, which may be described as remnants of the past and thereby "condemned to an inevitable neglect." De Sousa Santos, B. (2008). Epistemologias do Sul. *Revista Critíca de Ciências Sociais, 80*, 5-10: 6.
[490] Ramirez G., F. (2016). Political Change, State Autonomy, and Post-Neoliberalism in Ecuador, 2007-2012. (C. Perez, tr.). *Latin American Perspectives*, 206, 143-157: 144.
[491] *Ingenios* Act, Los Considerandos, ¶1.

property and technology transfer. Additionally, following the enactment of the *Ingenios* Act, the Ecuadorian Intellectual Property Institute was replaced by a new National Service for Intellectual Rights,[492] an entity that also falls under the oversight of the Secretariat.[493]

Likewise, under the *Ingenios* system, the National Secretariat of Higher Education, Science, Technology and Innovation oversees multiple institutional manifestations of the National System for Science, Technology, Innovation and Ancestral Knowledge. Recently established physical spaces designed for the expansion of knowledge and innovation ecosystems include special technological zones for economic development; planned cities oriented towards scientific research and entrepreneurship (e.g., Yachay, the "City of Knowledge"[494]); scientific-technological parks; techno-industrial parks; and technology transfer centres. The idea is that in these places, "the collaborative flows of knowledge and technology will be stimulated and managed, among all of the actors of the social economy of knowledge, creativity and innovation."[495] The *Ingenios* Act does not envisage the sort of public sector exclusivity of twentieth century socialist or communist economic models. Nevertheless, its provisions reset relationships between public and private actors, such that these interactions are subject to continual scrutiny by the State, through the broad discretionary powers that the law grants to the National Secretariat of Higher Education, Science, Technology and Innovation.

As mentioned earlier, the new institutionalism that the *Ingenios* Act establishes is a manifestation of the tenets of twenty-first century socialism. This emergent political theory has been described as a "centre-left pragmatic model seeking to maximise state-captured profits to finance state infrastructure and ambitious social programs" or alternately, as "Andean capitalism."[496] According to such a regime and in contrast to State sponsored socialist models popularised in the twentieth century, the private sector is supposed to play an express and important profit-generating function. However, as opposed to the neoliberal economic model – as it is characterised by the

[492] Decreto Presidencial No. 1425, *supra* note 405.
[493] *Ingenios* Act, Disposiciones Transitorias, Quinta.
[494] *See* Yachay homepage, *retrieved from* http://www.yachay.gob.ec/.
[495] *Ingenios* Act, Art. 17.
[496] Silva, V. (2016). The Return of the State, New Social Actors, and Post-Neoliberalism in Ecuador. *Latin American Perspectives,* 206, 4-17: 4.

Ingenios Act – in an "Andean capitalist" system the State retains significant redistributive power.

As described by René Ramírez, the Minister of the National Secretariat of Higher Education, Science, Technology and Innovation during the Correa presidency and one of the visionaries behind the *Ingenios* project, the idea is "to distribute producing and produce redistributing sustainably, putting life first and not the accumulation of capital."[497] This vision statement for the *Ingenios* model simultaneously encompasses elements of twenty-first century socialism and the *buen vivir* worldview. The intention of economic reformulation is reflected in the law's attempt to expand the traditional forms of intellectual property ownership. To disrupt the standard dichotomy between public and private spheres of proprietary rights, the *Ingenios* Act creates space for multiple forms of collective ownership, including public, private, communitarian, state, associative, cooperative, and mixed.[498]

Despite this innovation, a precise definition of each of these categories is not provided in the *Ingenios* Act. Although the 2008 Constitution recognises the same variegated forms of ownership,[499] they are not explicitly defined in this latter document either. Thus, the parameters delimiting the boundaries between the various forms of property remain to be drawn. The failure to define each form of ownership suggests that the makers of the *Ingenios* Act were more concerned with elaborating the role of the State in intellectual property governance than with empowering potentially competing forms of cooperative organisation. Nevertheless, definitions of the various categories of intellectual property ownership could still be fixed in the *Ingenios* technical regulations that are expected to be finalised sometime in 2019. Alternatively, the meaning of each of the seven categories of rights could be left to judicial interpretation.

Another area in which the *Ingenios* Act aspires to transcend conventional doctrinal forms is the conceptual association that the text performs to link intellectual property and human rights. The General Principles of the section of the Act concerned with intellectual property state, "the acquisition and exercise [of intellectual property rights], as well as their weighing with other rights, shall assure the effective enjoyment of fundamental rights and shall contribute to an adequate diffusion of knowledge in

[497] Ramírez, *supra* note 447 at 35.
[498] *Ingenios* Act, Art. 82.
[499] Constitutión de la República de Ecuador de 2008, Art. 321.

benefit of the owners and society."[500] Here again, intellectual property is conceived as a tool to accomplish certain national goals, primary among which is the broad dissemination of knowledge. Meanwhile, intellectual property is subordinated to other rights regimes, including those of "health and nutrition, education, information, access to culture and to participate in scientific progress, as well as the right to develop economic activities, freedom of work, to access quality goods and services, and the rights to other forms of property."[501]

These provisions suggest that eventually, intellectual property enforcement under the new regime could regularly involve the invocation of other legal frameworks, in effect transcending the actual provisions of the *Ingenios* Act. Judges could resolve disputes over infringement based not on intellectual property norms, relying instead on constitutional considerations related to diverse categories of human rights. In any event, under the *Ingenios* Act the acquisition and exercise of intellectual property ownership is contingent upon the extent to which exclusivity would promote social innovation and the transfer and diffusion of knowledge, towards the reciprocal benefit of producers and users "in a way that favours social and economic well-being and the balance between rights and obligations."[502]

A primary effect of this mandated balancing of interests is a comprehensive, interventionist role of the State in general, and of the National Secretariat of Higher Education, Science, Technology and Innovation in particular, surrounding matters of intellectual property. The *Ingenios* Act declares intellectual property to be "of public interest and [thus it] shall enjoy a form of protection that allows for the satisfaction of the basic needs of society."[503] Essentially, the Act epitomises an attempt to deviate from the idea that intellectual property protection should be granted simply "as an end in itself,"[504] instead favouring the strategic use of intellectual property as a means to accomplish specific, centrally defined goals, which would manifest the Ecuadorian State's conceptualisation of public interest.

Overall, the aspirations of the *Ingenios* Act consistently express a desire to move beyond the conventional logic of intellectual property. If its goals were fully

[500] *Ingenios* Act, Art. 81.
[501] *Ingenios* Act, Art. 83.
[502] *Id*.
[503] *Ingenios* Act, Art. 87.
[504] *See* Peukert, A. (2011). Intellectual Property as an End in Itself? *European Intellectual Property Review, 33*, 67-71.

realised, the law would foster broad access to knowledge, pluralise ontologies for knowledge production, contribute to the reconfiguration of the Ecuadorian economy, and create a *buen vivir* society. However, it is not sufficient to take the stated goals of the *Ingenios* Act for granted. Instead, a thorough analysis is needed of the actual provisions of the law, to understand whether the Act truly reimagines intellectual property.

3.4. Does the *Ingenios* Act really reimagine intellectual property?

Both the text of the *Ingenios* Act and the broader socialisation efforts that surrounded the making of the new regime claimed that the *Ingenios* project would reimagine the conventional logic of intellectual property and, as a result, the role that intellectual property plays in Ecuadorian society. It was supposed that this would occur, for instance, through the pluralisation of the conceptualisation of knowledge that the *Ingenios* Act embodies. Multiple motivations drove the attempt to experiment with new rationalities for intellectual property in Ecuador. These drivers have been most commonly explained in relation to the general theory of proprietary individual rights, or in the specific domain of patent law. Rather than follow this trend, this thesis explores how the *Ingenios* Act might offer innovative ways of thinking about intellectual property for plants.

As discussed in prior sections of Chapter 3, Ecuadorian policymakers recently adopted a new vision through which the country's economy and society might begin to be restructured. The goals that this strategy espoused included transforming the national "productive matrix" of the economy to shift the basis of wealth creation from extraction and exportation of commodities with little value added to a system founded on the generation, broad diffusion, and eventual commodification of knowledge. Earlier sections of Chapter 3 also showed that the general rationale underlying the *Ingenios* project was to create a system that would foster the creation of a "social economy of knowledge, creativity, and innovation."

However, the identification of these broad aspirations still leaves several key inquiries unanswered. For instance, why did the national intellectual property framework need to be remade to actualise the government's economic and social objectives? What were the limitations of intellectual property as it was formerly

imagined under the 1998 Ecuadorian Intellectual Property Law? Why did lawmakers believe that enacting a law whose central purpose is to provide intellectual property protection was the optimal way of achieving their goals, given the doubts that these actors expressed about the 1998 Law? Finally, did the *Ingenios* system of intellectual property for plants diverge from the standardised logic of plant breeders' rights? If so, how did the new framework accomplish this end?

The texts of the *Ingenios* Act offer a convenient starting point to address these queries. In addition to explicitly announcing their purposes in the law, the officials involved in the making of the Act also engaged in broad marketing efforts, promoting the project as a significant departure from the conventional rationality of intellectual property. The "socialisation" campaign garnered significant attention in national and international realms, with officials touting the *Ingenios* Act as an important example of participatory lawmaking.[505]

Ultimately, it will be important to consider the perspectives of these officials to understand fully the assumptions that underlie the *Ingenios* project. However, it is appropriate to begin with the text of the law. The version of the *Ingenios* Bill that was submitted to the National Assembly in 2015 declared:

> "The [*Ingenios*] Project…constitutes a normative instrument that aims to radically modify the existing paradigms in the generation, use, utilisation and distribution of the public good knowledge, through the implementation of juridical norms that facilitate just relationships between diverse social actors, as well as the necessary conditions for the balanced access to the benefits from this good to achieve the greatest degree possible of the satisfaction of needs and the full exercise of the rights of persons and nature."[506]

According to this formulation, the essential purpose of the *Ingenios* initiative was to reimagine the role of knowledge in Ecuadorian society. Of principal concern was the "scarce endogenous development of knowledge in the country."[507] The Exposition of Motives of the *Ingenios* Bill lamented the low number of patent applications filed by Ecuadorians, the "nearly null" innovation generated by domestic firms, and the limited public expenditures in science, technology, and innovation as a

[505] This process is discussed in the following article, though it should be noted that two of the authors were governmental officials directly involved in the making of Ingenios. Terán, et al., *supra* note 438.
[506] *Ingenios* Bill, Exposición de Motivos, ¶1.
[507] *Id*. at ¶2.

proportion of gross domestic product. “In this context, our cognitive and technological matrix has been predominantly dependent on the activities and goods produced in and by ‘developed’ countries.”[508]

According to the *Ingenios* Bill, this situation was exacerbated by the fact that

> “[T]he existence of the Intellectual Property Law approved in 1998, which for nearly 20 years, through a hyper-privatising system of knowledge…has solely benefitted the intellectual property owners/merchants corresponding to a few transnational monopolies, has limited the possibility to innovate, and [has failed] to attract foreign investment.”[509]

This language plainly describes the perception that the drafters of the *Ingenios* Bill had of the international status quo. In other words, these governmental actors understood that a system that grants exclusive proprietary rights could operate as a tool of economic subjugation, a function that should be resisted and reappropriated. However, contradictions exist between the several stated aspirations of the *Ingenios* Bill, such that certain objectives recapitulate the kind of “developmentalist” thinking that lawmakers claimed to be abandoning.[510] The result is a curious hybridisation in which

> “[D]efinitively, the [*Ingenios*] Project determines a new institutionality which, inside of the international juridical order, promotes the generation of knowledge under an open, social, democratic, inclusive system, focused on human beings, on the development of their potential and exercise of their rights, within the framework of respect for the rights of others and of nature.”[511]

The logic of the *Ingenios* Bill suggests that it would be possible to declare the “good” of knowledge to be of “public interest” as a response to the “cognitive capitalist model reigning in the international commercial context”[512] and simultaneously to achieve economic development, human self-actualisation, and harmony with nature within an episteme of *buen vivir*.

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[508] *Id*.
[509] *Id*. at ¶5.
[510] Some scholars have argued that the tension between a professed shift towards a *buen vivir* model for rural development and actual “neo-developmentalist” policies was inherent to many of the reforms undertaken by the Citizen’s Revolution government under President Rafael Correa. *See, e.g.,* Clark, P. (2017). Neo-developmentalism and a “*Vía Campesina*” for Rural Development: Unreconciled Projects in Ecuador’s Citizen’s Revolution. *Journal of Agrarian Change, 17*(2), 348-364.
[511] *Ingenios* Bill, Exposición de Motivos, at ¶6.
[512] *Id*. at ¶7.

These aspirations, which have a utopic resonance, positioned the State as the central broker responsible for refereeing the movement of knowledge. According to the *Ingenios* Act, since extant models for the protection and management of knowledge "do not respond to the state of scientific and technological development in which we find ourselves," "[i]t is necessary, then, that the State may…intervene in unjust situations, in which the distribution of knowledge is not only desirable but vital to achieve common wellbeing."[513] In effect, one of the aims of the *Ingenios* project was to restructure the relationships between the various stakeholders who interact with the intellectual property system. This "new model" promised "a balance between the rights of the owners of intellectual property rights…and users, competitors and citizens, to achieve a greater democratisation of the benefits and opportunities of knowledge."[514]

Democratic in this context does not necessarily signify popular. Instead, the democratisation of knowledge falls under the purview of Ecuadorian bureaucrats. As discussed in prior sections of Chapter 3, upon implementation of the *Ingenios* Act, officials at the National Secretariat of Higher Education, Science, Technology and Innovation will be responsible for a wide range of actions. These will include the creation and regulation of "knowledge spaces;" oversight of the accreditation and promotion of researchers and educators; and mediation of agreements for access to biological and genetic resources. These officials will also be tasked with the establishment of a "typology of goods" in areas of strategic focus, based on which mechanisms such as compulsory licenses may be used to access subject matter protected as intellectual property.

Although the consolidation of disparate conceptual orientations and pragmatic institutional operations may be uncommon, the legal imaginaries that the *Ingenios* project seeks to realise are not necessarily novel. For instance, compulsory licenses as a State-mediated balancing mechanism are firmly established in international intellectual property jurisprudence. What is unusual is the fact that the law speaks of breaking with the "positivist and Western canons" of a "Eurocentric cosmology."[515] Despite this, the *Ingenios* Act enables the consolidation of singular nation-state – in contrast to the "plurinationality" imagined by the 2008 Constitution – through processes of re-centralisation. A further inconsistency is manifest in the heavy reliance

[513] *Id*. at ¶8.
[514] *Id*. at ¶12.
[515] *Id*. at ¶7.

in the *Ingenios* Act on rights-based notions of liberal democratic citizenship, even while the law discusses "interculturality" and "knowledges" in the plural form. Thus, a central question is, how radical is the *Ingenios* Act? Which aspects of the law constitute innovations and which parts simply repackage the conventional intellectual property narrative in reformist language? These queries can be addressed by contrasting the Act's self-referential discourse with the words of actors involved in its making.

While the various texts produced by the *Ingenios* project may attempt to speak for themselves, it would be insufficient to read these documents in isolation from their embedded and strategic position within the Citizen's Revolution government. René Ramírez, who served as Minister of the National Secretariat of Higher Education, Science, Technology and Innovation under the presidential administration of Rafael Correa, was one of the key visionaries behind the *Ingenios* Act. Ramírez has explained that the evolution of his ideas surrounding the reconfiguration of the access, generation, and circulation of knowledge began to gestate when he served as Minister of the National Secretariat for Planning and Development. In this role, Ramírez was involved in the making of a new higher education law which, among other reforms, created a system of free, universal tertiary education in Ecuador. During this process, Ramírez says he came to believe that education could not be truly free and accessible to all Ecuadorians if the products of knowledge continued to be privatised, or in other words, protected as intellectual property.

> "Therefore, it was there where I said, we need [the *Ingenios* Act]. And in this framework, knowing that we cannot withdraw from international norms, it is necessary to have…I would have liked for it to be much more radical in the sense of the recuperation of public and common knowledge and culture. But you can't because of the issue of international treaties. So, [we formulated] all intellectual property as an exception to the public domain, trying to recover as much as we can in the entire corpus of the law, this spirit."[516]

Other officials likewise suggested that effect of the *Ingenios* experiment was not to break entirely from standard approaches to the governance of intellectual property. Instead, the process involved interpretative playfulness, including with the

[516] René Ramírez, former Minister of the National Secretariat for Higher Education, Science, Technology and Innovation (SENESCYT). (15 June 2016). Personal interview.

lacunae that may be located in international agreements. For instance, an official at the Yachay public enterprise told me that the *Ingenios* Act

> "…doesn't claim to abandon TRIPS. Rather, within the reigning international structure, it tries to find cracks and vacuums in the international legislation – which our own government has signed onto – in which principles could be inserted that are more progressive and more – why not say it – opportunistic in our stage of development."[517]

The same official further noted:

> "I think that we reconceptualise our role within the system, but the schema of intellectual property is not reconceptualised. (…) It is coherent with the reformist vision of the government. It isn't a socialist revolution. It isn't the Paris Commune. But it is a space where…you can enjoy certain tunnels through which to pass, to be able to emerge in a new place, without needing to collide with other actors in the international system."[518]

This explanation of the purpose of the *Ingenios* Act softens the language with which the text of the law is framed. Although the introductory sections of the Act speak of "radical transformation," many of the actors in the Citizens' Revolution government with whom I spoke emphasized that the fundamental purpose of the law was to provide a mechanism for changing the "productive matrix" of the country. One official went so far as to describe intellectual property under the *Ingenios* Act as "a weapon for development."[519] This characterisation is consistent with the interpretation of Ecuadorian academics familiar with the *Ingenios* project, who have described it as a "policy of resistance" based on the development model of the Citizens' Revolution government.[520] Therefore, the making of the *Ingenios* Act involved the defiance of certain global dynamics that the framers of the law identified as problematic. However, the process was not one of radical reinvention or outright rejection of standard intellectual property norms.

In order to identify gaps in the treaty regimes to which Ecuador is party, the lawmakers responsible for drafting the *Ingenios* Bill enlisted the help of external

[517] Director level official at the Yachay Public Enterprise. (1 April 2016). Personal interview.
[518] *Id*.
[519] Director level official at the Yachay Public Enterprise. (18 April 2016). Personal interview.
[520] Researcher at the Centro Internacional de Estudios Superiores de Comunicación para América Latina (CIESPAL). (13 July 2016). Personal interview.

consultants. These actors included the South Centre,[521] the Chilean non-governmental organisation Corporación Innovarte[522] and academics from the Sorbonne[523] and the Latin American Faculty for Social Sciences.[524] One of the individuals involved was Professor Carlos Correa,[525] who described the process of drafting the *Ingenios* text as characterised by taking calculated risks with legislation.

> "In the consultancy that I and others did in Ecuador, [we] tried to find solutions that are compatible. If they aren't, well, some other World Trade Organization member country would have to lodge a complaint, would need to put together a panel, and if Ecuador has made a mistake, it would have the opportunity to correct it. But in any case, what [the *Ingenios* Act] tries to do is to operate within the limit of the legitimate, in ways that are of interest for the country. It can be seen that other countries are following similar paths. None of them have been challenged in the World Trade Organization for reasons of TRIPS compliance."[526]

In other words, at least in the sections of the law concerned with conventional intellectual property norms – for instance, those related to patents, copyrights, trademarks, and plant breeders' rights – the exercise was one of finding flexibilities within the existing frameworks rather than re-creating these regimes. Furthermore,

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[521] The South Centre is the intergovernmental organization of developing countries that helps developing countries to combine their efforts and expertise to promote their common interests in the international arena. The South Centre (n/d) About the South Centre. *Retrieved from* https://www.southcentre.int/about-the-south-centre/.

[522] The Innovarte Corporation is an NGO based in Santiago, Chile whose mission is "to build capacity to design, understand, and utilise a balanced system of intellectual property norms that would promote…economic and social development of communities." Innovarte (n/d) Quiénes somos. *Retrieved from* http://sitio.innovarte.cl/quienes-somos/.

[523] Academics from the Sorbonne in France, including Carlo Vercellone, have openly expressed support for the Ingenios project. In 2015, Ingenios was reportedly included as part of the curriculum of study for a doctoral program in "cognitive capitalism" at the Sorbonne. IEPI (26 de junio de 2015) El Proyecto INGENIOS como modelo de estudio en la Universidad Sorbona de París. *Retrieved from* https://www.propiedadintelectual.gob.ec/el-proyecto-ingenios-como-modelo-de-estudio-en-la-universidad-sorbona-de-paris/.

[524] The Latin American Social Sciences Faculty (FLACSO) in, Argentina, analysed Ingenios in a debate and "socialization" event in Buenos Aires in July 2015. IEPI. (3 de Julio de 2015). Código INGENIOS es acogido con éxito en Argentina. *Retrieved from* https://www.propiedadintelectual.gob.ec/codigo-ingenios-es-acogido-con-exito-en-argentina/.

[525] Note that Professor Correa is also the author of several works that describe the policy space for patent and plant variety protection lawmaking under the TRIPS Agreement. These proposals are discussed in greater detail in earlier sections of this thesis.

[526] Carlos Correa, Professor at the University of Buenos Aires and Consultant with the South Centre. (21 March 2016). Personal interview. *See also* Correa, *supra* note 282 at 58 (stating that "no complaint has been submitted against countries that granted [compulsory licenses]/government use under the WTO dispute settlement rules.").

while the making of the *Ingenios* Act was partially driven by a desire to take advantage of the available formal policy space, the strategy was also motivated by the internal philosophy and goals of the Citizens' Revolution government. Notwithstanding its stated orientation towards "post-developmentalism," the Correa administration regularly operated in a way that was consistent with the tenets of neoliberal developmentalism.[527]

It is also important to highlight the fact that the drafting of the *Ingenios* text was processual rather than discrete. When compiling preliminary versions of the Bill, lawmakers engaged in experimentation, in some instances deviating substantially from international intellectual property standards.[528] However, as the *Ingenios* Bill matured and a greater number of actors representing a wider variety of interests became involved, the provisions of the draft law increasingly began to conform more than reform.

There are at least two reasons for this de-radicalisation. The first relates to internal tensions that operated behind the scenes during the making of the *Ingenios* Act. As the project evolved – especially between the release of the first public version of the Bill online via the Wikimedia page in October 2014, and the submission of a finalised version of the text to the National Assembly in June 2015 – progressive and conservative actors within the Citizen's Revolution government clashed with one another.[529] These conflicts coincided with and were exacerbated by the fact that as the *Ingenios* project progressed through stages of internal drafts by a small number of officials in the Ecuadorian Intellectual Property Institute, to a period of public comment, to submission to and debate within the National Assembly, national presidential elections loomed ever nearer. When the *Ingenios* Act was finally passed and published in the Official Register in December 2016, the polemical election that could have ended the era of the Citizen's Revolution was merely weeks away.[530]

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[527] Escobar, A. (2010). Latin America at a Crossroads: Alternative Modernizations, Post-Liberalism, or Post-Development? *Cultural Studies, 24*(1), 1-65. Radcliffe, S. A. (2012). Development for a Postneoliberal Era? *Sumak Kawsay,* Living Well and the Limits to Decolonisation in Ecuador. *Geoforum, 43*(2012), 240-249. Wilson, J. & Bayon, M. (2017). The Nature of Post-Neoliberalism: Building Bio-Socialism in the Ecuadorian Amazon. *Geoforum, 81*(2017), 55-65.

[528] Consultant from FLOK Society who was involved in compiling comments made to the *Ingenios* Bill text. (17 May 2016). Personal interview; Director level official from the Ecuadorian Intellectual Property Institute. (16 April 2016). Personal interview.

[529] Director level official from the Ecuadorian Intellectual Property Institute. (16 April 2016). Personal interview.

[530] The first round of presidential elections was held on 19 February 2017. Rafael Correa was no longer eligible to run as a candidate, as term limits had been established in the 2008 Constitution.

In May 2016, one directorial level official at the Ecuadorian Intellectual Property Institute noted:

> "We are living in a *sui generis* political moment. [We have] a government that has had nine years in power and is in a normal process of winding down. We have elections next year. Therefore, almost everything that is being discussed at this time [in relation to the *Ingenios* project] is politicised. Is extremely politicised."[531]

This politicisation manifested itself textually in the *Ingenios* Act, as different factions struggled over the question of how radical to render the law. Initially, the National Secretariat of Higher Education, Science, Technology and Innovation was the principal institutional actor involved in the making of the *Ingenios* Act. Under the vision of Minister René Ramírez, as we have already seen, one of the primary motivations was to re-create the national system of science, technology, and innovation. At the outset, the question was, as another directorial level official within the Ecuadorian Intellectual Property Institute told me,

> "How do we change the system of science, technology, and innovation? An analysis was done of how it could be changed. And a fundamental part was intellectual property rights."[532]

At this point, the second reason for why the *Ingenios* project was de-radicalised emerged. Beginning in 2013, the idea to reform the intellectual property law was taken up as

> "…an issue at the ministerial level. But they didn't have much of an idea of what international treaties are. They thought that it was as easy as making our own law, with whatever standards you want, but it was not like that."[533]

Thus, officials at the National Secretariat of Higher Education, Science, Technology and Innovation contracted a private law firm to conduct an analysis for the

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Thus, the contest was primarily between Correa's Vice President, Lenín Moreno, and several opposition parties. However, no candidate was able to achieve more than the required popular vote margin in the first round, therefore triggering a runoff election on 2 April 2017. Ultimately, Moreno won this election by a narrow margin of 51.15%, while the majority opposition candidate Guillermo Lasso, called for a recount and protests erupted across the country. The Citizen's Revolution is now positioned to remain in power until 2021, though its policies have become increasingly contested in recent years.

[531] Director level official from the Ecuadorian Intellectual Property Institute. (12 May 2016). Personal interview.

[532] Director level official from the Ecuadorian Intellectual Property Institute. (16 April 2016). Personal interview.

[533] *Id*.

purpose of identifying parts of the 1998 Intellectual Property Law that could be effectively revised within the parameters of Ecuador's international obligations. After reviewing this external analysis, the Secretariat ultimately rejected the changes it proposed as overly "tied to private interests."[534] At that point, the Secretariat decided to assemble its own small team under the leadership of the Director of the Ecuadorian Intellectual Property Institute to construct an entirely *sui generis* regime, although as discussed earlier the extent to which the "new text" could be truly novel was shaped by a variety of forces, both external and internal.

One of the original drafters involved in the making of the new text described the process to me:

> "The work was developed in matrices. So, you have the text of the current intellectual property law. You have the text of the Andean Community decisions, and you have here the proposed text. And in each one of these, you have observations. So, it occurs to me that the law should say this in that article. But TRIPS, what does it tell you? You see that TRIPS doesn't say anything, so why don't we take it up? Or no, let's change this. This was the style. The analysis is not only of TRIPS but also for example, [the] Berne [Convention] speaks about this. [The] Paris [Convention] tells you that.
>
> Afterwards, we went area by area, reviewing. Copyright, industrial property, plant varieties. This is how we went, building. I can't tell you how much time it took exactly, but I know that we worked Saturday and Sunday. A moment arrived when I didn't know what day it was. It reached that level. What day is today? There was political pressure because this had to happen fast. Because obviously they wanted [the law] to be passed before the next election period."[535]

In this way, the final version of the *Ingenios* text did not simply result from an isolated experiment-in-lawmaking conducted in the meeting rooms and cubicles of administrative buildings in Quito. Nor was the new law primarily shaped by the transversal democratic participation of ordinary Ecuadorian citizens, whether through online engagement with the Wiki site or physical presence at *Ingenios* sensitisation

[534] *Id*.
[535] *Id*.

events. Instead, the Act was crafted through a technical, iterative, and highly referential practice of assemblage, in which policy structures originally devised in nineteenth-century Paris were amalgamated with objectives associated with twenty-first century socialism ideals, and with institutional translations of Andean cosmology.

Throughout this process, internal political pressures constantly interrupted and refashioned the development of this patchwork of intellectual property. An official at the Ecuadorian Intellectual Property Institute confided to me that:

> "I think that the pressure was from the Minister himself, and what we'll call the left wing of the government. Because there were interests on the right that said, 'we don't want this.' And above all the pressure was because a [free trade] agreement was going to be negotiated with the European Union. And the left wing was against the agreement with the European Union, above all because of intellectual property issues."[536]

The pressures from outside and within the Ecuadorian government did not operate in isolation from one another. Instead, these influences regularly intertwined. As another person who was involved in the early stages of the drafting process explained to me,

> "The Ecuadorian system has international agreements and the Constitution. And current laws cannot be transcended in a new framework. And within this new framework there also exists a political vision of the current government, and there are limits within which you have to play."[537]

A further twist was the fact that at times, rather than solely being subject to forces external to the lawmaking process, the *Ingenios* Act itself became an instrument through which pressure could be exacted on other actors. For instance, during negotiations towards the free trade agreement with the European Union, one official revealed to me that

> "they began to put in many more compulsory licenses. It was to pressure, to get rid of the matter of the negotiations with the European Union. Let's grant compulsory licenses. Because this is going to bother them, and it is going to make the agreement fall through."[538]

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[536] *Id*.
[537] Consultant from FLOK Society who was involved in compiling comments made to the *Ingenios* Bill text. (17 May 2016). Personal interview.
[538] Director level official from the Ecuadorian Intellectual Property Institute. (16 April 2016). Personal interview.

Thus, notwithstanding the stylised language of the *Ingenios* Act surrounding the radical transformation of intellectual property, the project has in fact embodied a variety of purposes since its inception. The final language of the *Ingenios* Act was influenced by numerous actors and contextual factors, which gradually rendered the text less radical over time and as the law was drafted and redrafted. Furthermore, the *Ingenios* paradigm was destined from the outset to be bounded in certain respects. As lawmakers consistently acknowledged when I interviewed them, the Citizen's Revolution government never intended to withdraw from the World Trade Organization or from other treaties to which Ecuador is party.

> "[T]he Constitution of the Republic was approved by 82% of the population in referendum.[539] Therefore, the fact of having such a strong capacity to mobilise volunteers – and with a political project that calmly could have said 'I'm leaving the World Trade Organization. Because it's the way' – with the political legitimacy that the project had, we could have easily done it. But I don't think it was ever an objective."[540]

Even in the excitement that the small team of drafters experienced over the perception that they were reimagining intellectual property, that they were creating something that had never been tested in other countries, the notion of withdrawing from the World Trade Organization or other international obligations was never seriously considered. One of the drafters of early versions of the *Ingenios* Bill explained the deliberations to me as such:

> "In one moment, the idea came out: what happens if we leave the World Trade Organization? But later, of course, we analysed it more clearly and realised it wasn't possible. Aside from the fact that it was our idea, not the government's."[541]

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[539] Although during this interview, the government official with whom I spoke stated that the 2008 Ecuadorian Constitution was approved by 82% of the population, this is an overestimate. In fact, 63.9% of the 75.8% of the eligible population that participated in the referendum vote chose "yes" when asked, "Do you agree with the text in the New Poligical Constitution written by the Constituent Assembly. Political Database of the Americas. "2008 Revocatory Referendum, Ecuador." Edmund A. Walsh School of Foreign Service, Center for Latin American Studies, Georgetown University (8 October 2008). *Retrieved from* http://pdba.georgetown.edu/Elecdata/Ecuador/refconst08.html. The statistic of 82% more accurately refers to the proportion of voters who agreed in 2007 to form a Constituent Assembly to draft a new constitutional text. "Ecuador convoca para el 30 de septiembre las elecciones a la Asamblea Constituyente." *El País* (25 April 2007). *Retrieved from* https://elpais.com/internacional/2007/04/25/actualidad/1177452004_850215.html.

[540] Director level official at the Yachay Public Enterprise. (1 April 2016). Personal interview.

[541] Director level official from the Ecuadorian Intellectual Property Institute. (16 April 2016). Personal interview.

This statement reveals one of the fundamental themes of governance under the Citizens' Revolution in Ecuador. Consistent with the tenets of twenty-first century socialism or Andean capitalism, Ecuadorian lawmakers plainly stated that their intention was to charter a path between classical socialism and neoliberal capitalism, to "bring back the State" but not to entirely abandon free-market economics. This strategy was manifested concretely in the *Ingenios* Act through a series of compromises. Thus, reformist aspirations were married to provisions that attempted to take advantage of the policy space that remained in international agreements, without substantively forsaking the dominant paradigm. As one Citizens' Revolution official characterised it, the strategy was "disruptive, but not rupturist."[542]

This approach, involving a progressive but not necessarily transformative reform of intellectual property law in general, could potentially represent a source of inspiration for other countries whose circumstances are similar to those of Ecuador. However, up to this point the thesis has not focused specifically on whether the new Ecuadorian system of intellectual property for plants actually deviates from the conventional logic of plant breeders' rights. For this reason, Chapter 4 of this thesis will explore how officials in Ecuador have approached the regulation of plants as intellectual property. Chapter 4 will also consider how Ecuadorian lawmakers have adopted different legal strategies to govern the access and use of different types of plants, including through laws that regulate farmers' seeds and traditional knowledge. Subsequently, Chapter 5 will extrapolate lessons from the Ecuadorian experience to develop a series of policy options that other countries could consider to govern the uses of different types of plants.

[542] Directorial level official at the Yachay Public Enterprise. (1 April 2016). Personal interview.

Chapter 4. Experimenting with Innovative Lawmaking in Ecuador

A central contention of this thesis is that notwithstanding the availability of a formal legal space for the making of intellectual property laws for plants, in practice experimentation in lawmaking has diminished. This is due in part to the global expansion and durability of the logic of plant breeders' rights, a way of thinking that has been most visibly inscribed in the UPOV Convention. Accordingly, plants have been conceptualised in a way that approximates other subject matter protected as intellectual property.

Laws that regulate plants as intellectual property frequently emphasize the importance of incentivising innovation in plant breeding, of rewarding technological advancement in plant genetics, and of providing economic remuneration for these efforts through exclusive proprietary rights. Part 1 of the thesis demonstrated how this way of thinking developed and spread over time, even as alternative lawmaking priorities related to the governance of different types of plants have also become increasingly visible. Subsequently, Chapter 3 introduced the legislative experiment that the *Ingenios* Act of Ecuador embodies. This new legal instrument purposively questions many of the conventional assumptions of intellectual property law.

While Chapter 3 presented the history and theory of the overall *Ingenios* project, Chapter 4 will show how the Act and other recently introduced Ecuadorian regimes have responded to the need to find local solutions for the regulation of plants as intellectual property. The exploration that follows will demonstrate that in Ecuador, although it is true that opportunities for experimentation with locally tailored intellectual property laws for plants have been in some ways formally bounded, alternative imaginaries may still be located to structure relationships between people, institutions, and different kinds of plants. The experimentation that Ecuadorian lawmakers have undertaken transcends the conventional domain of intellectual property, to include administrative regulations to implement the *Ingenios* system of plant breeders' rights; a new law for the regulation of agrobiodiversity, seeds, and sustainable agriculture; a framework for the protection for traditional knowledge; and a regime to govern access to genetic resources and equitable benefit sharing. The case study of Ecuador demonstrates that it is necessary for countries to move beyond the logic of plant breeders' rights to imagine new futures that would consider the needs of the multiplicity of actors who participate in the national agricultural sector.

Part 1 of this thesis showed that a series of obligations contained in international agreements legally constrain the ways that many countries may regulate plants as intellectual property. As was noted earlier, Ecuador is a member of the World Trade Organization, and the country is not classified as "least-developed." This subjects Ecuador to the basic requirement that it must protect new varieties of plants with some form of intellectual property, whether via patents, a *sui generis* system, or a combination of both. Furthermore, the country is legally bound to the 1978 version of the UPOV Convention, the norms of the regional Andean Community, and several other international instruments that relate to the regulation of plants according to the rationality of intellectual property.

The international obligations to which Ecuador is subject dictate that any regime that the country might enact must allow for the protection of plant breeder's rights, in accordance with the terms of UPOV 1978 and the Andean Community Decision No. 345. It has been broadly acknowledged that the plant breeders' rights model was developed primarily to suit the realities of industrialised agriculture in developed countries, based on the "standard argument" that this form of intellectual property will stimulate investment in research, contribute to the development of the domestic seed sector, and enable countries to take advantage of foreign technology.[543] However, this line of reasoning does not take into account the nature of Ecuadorian agriculture and the fact that it may differ from that of most industrialised countries.

Diverse stakeholders represent important constituencies in the agricultural sector in Ecuador. These include large-scale growers who produce commodities – for example, fresh cut flowers, bananas, coffee, and cacao – primarily destined for export markets. Meanwhile, many Ecuadorians practice forms of customary agriculture. This group is comprised of individual small-scale farmers – some of whom are members of indigenous communities – and farmer cooperatives. During the making of the *Ingenios* Act, Ecuadorian politicians and bureaucrats formally accepted inputs that these various stakeholders submitted. Nevertheless, as described in Chapter 3 of the thesis, local perspectives were at times marginalised by other factors.

For instance, the systems for plant breeders' rights elaborated in the 1978 version of the UPOV Convention and in Decision No. 345 of the Andean Community provide clear baselines for how Ecuador should regulate plants as intellectual

[543] Tripp, Louwaars, & Eaton, *supra* note 350 at 355.

property. However, these regimes are not concerned with the governance of plants that do not qualify as new, distinct, uniform, and stable varieties. Nevertheless, Ecuador has taken on other international commitments that require the country to legislate issues related to these other types of plants, including the Convention on Biological Diversity, the Plant Treaty, and the Nagoya Protocol. Membership in these regimes means that Ecuador must enact laws related to issues such as access and benefit sharing for plant genetic resources and farmers' rights.

As a result of these various engagements, during the making of the *Ingenios* Act Ecuadorian lawmakers were charged with the difficult task of not only ensuring that the new plant breeders' rights law would comply with the 1978 version of the UPOV Convention and Decision No. 345 of the Andean Community. These officials also needed to consider how mechanisms could be created to realise other goals, including the conservation of agrobiodiversity, the protection of customary agricultural practices, the Ecuadorian constitutional guarantee of food sovereignty, the regulation of access to plant genetic resources, and the governance of traditional knowledge related to agriculture and the environment. Notwithstanding the templates provided by the various relevant international regimes to which Ecuador is legally bound, these issues have proven difficult to implement at the national level.

The remainder of Chapter 4 will investigate various lawmaking experiments related to the regulation of plants as intellectual property that have been undertaken in Ecuador in recent years. These initiatives have been designed – though not always consciously or coherently – to balance the international obligations to which the country is subject with domestic concerns. The initiatives that will be described in Chapter 4 include the plant breeders' rights chapter of the *Ingenios* Act, the 2017 Law for Agrobiodiversity, Seeds, and the Promotion of Sustainable Agriculture, and the protections for traditional knowledge embodied in the *Ingenios* regime. However, prior to exploring the new Ecuadorian legal landscape, it will be important to characterise the nature of the country's agricultural sector so that the challenges which lawmakers faced during the making of the *Ingenios* Act may be better understood.

4.1. A "Plurination" of *Campesinos* and Industrialists: A Brief Introduction to Ecuadorian Agriculture

Ecuadorian agriculture has been depicted as a "mosaic" of systems, including subsistence farming as well as production for national markets and international export.[544] These diverse agricultural systems include a mixture of large, medium, and small-scale operations, whose produce ranges from "bust and boom" plantation crops to native food plants sourced from a variety of climates and ecosystems. In geophysical as well as sociocultural terms, Ecuador is a diverse country, characterised by a range of climactic zones and farming traditions that span the tropical lowlands on the Pacific coast, the Andean highlands whose glaciated volcanoes reach heights of over 6300m above sea level, and the lush rainforests of the Amazon basin. Customary agricultural practices evolved over centuries to this uniquely "vertical" landscape. Historically, communities in different ecozones practiced "ecological complementarity" as a means to minimize risk by planting and trading a diversity of crops timed around staggered planting and harvest seasons.[545] Thus, one of the key features that traditionally typifies Ecuadorian agriculture is "verticality," embodied in a system that is designed to exploit and control the maximum possible number of ecological niches at different altitudes, to ensure the sustainability of crop production and food security.[546]

Over the past half century, numerous factors have transformed the nature of smallholder farming in the highland regions of Ecuador. These include agrarian reform, according to which large plantations (*latifundios*) that since the period of colonisation were controlled by European-descended Ecuadorians were broken up in order to distribute the land more equitably, especially to indigenous and traditional peoples. Unfortunately, however, many scholars have observed that the most significant consequence of land reform was that it became harder for many smallholder farmers to access key resources, as customary systems of ecological complementarity were dismantled.[547] Additionally, small-scale Ecuadorian farmers report that numerous

[544] Rhoades, R. E. (2006). Linking Sustainability Science, Community and Culture. In R. E. Rhoades (Ed.). *Development with Identity: Community, Culture and Sustainability in the Andes.* Oxfordshire, UK: CABI Publishing. pp. 7.
[545] Moates, A. S. & Campbell, B. C. (2006). Incursion, Fragmentation and Tradition: Historical Ecology of Andean Cotacachi. In R. E. Rhoades (Ed.). *Development with Identity: Community, Culture and Sustainability in the Andes.* Oxfordshire, UK: CABI Publishing. pp. 28.
[546] *Id.* at 27.
[547] *Id*. at 39.

other challenges have complicated their agricultural management systems in recent years, ranging from decreased production, to climate change, to loss of traditional knowledge, to continued subjugation including – in the eyes of some communities – international non-governmental organisations that have encouraged the planting of improved varieties of crops.[548]

Meanwhile, industrial agricultural production continues to expand in Ecuador, both in terms of physical space and socio-political influence. According to the most recent statistics published by the Food and Agriculture Organization of the United Nations, industrial agriculture cultivates as much as 80 per cent of the productive land in Ecuador and utilizes 63 per cent of the water available for irrigation, even while constituting only 15 per cent of national agricultural production units.[549] Actors who practice large-scale agriculture in Ecuador principally grow crops for export, the most prominent of which are bananas, cacao, and coffee, as well as ornamental plants such as roses and carnations.

In contrast to the relatively small size of the industrial agricultural sector, approximately 85 per cent of the agricultural production units in Ecuador are classified as familial, with 64 per cent of national production in the hands of smallholder farmers.[550] Further highlighting the importance of small-scale agriculture, 60 per cent of the food consumed in Ecuador is sourced locally from family farms. This "*campesino*" agricultural sector is characterised by cultivation on small plots, mostly by individual family units, of crops that are important for subsistence, for exchange with other farmers, and for sale in local markets. Ecuadorian *campesinos* generally live below the national poverty line, and these small-scale and subsistence farmers rely on customary practices of seed saving and exchange through farmer-to-farmer networks to source planting material.[551] Although industrial agriculture contributes significantly to the national economy – three of Ecuador's top five non-petroleum

[548] Campbell, B. C. (2006). Why is the Earth Tired? A Comparartive Analysis of Agricultural Change and Intervention in Northern Ecuador. In R. E. Rhoades (Ed.). *Development with Identity: Community, Culture and Sustainability in the Andes.* Oxfordshire, UK: CABI Publishing.
[549] *Id*.
[550] "Ecuador en una mirada." Food and Agriculture Organization of the United Nations, Retrieved from: http://www.fao.org/ecuador/fao-en-ecuador/ecuador-en-una-mirada/en/ (accessed 1 November 2018).
[551] Santivañez, T., Tejada, G., Aguilera, J., Mastrocola, N., & Pinedo, R. (2014). Semillas Certificadas para la Agricultura Familiar en la Zona Andina. In S. Salcedo & L. Guzmán (Eds.) *Agricultura Familiar en América Latina y el Caribe: Recomendaciones de Política.* Santiago, Chile: Organización de las Naciones Unidas para la Alimentación y la Agricultura.

exports are agricultural products[552] – traditional forms of agriculture are much more relevant to Ecuadorians living in rural areas, both to provide a source of income and to guarantee food security.[553]

Beginning in the 1990s, advocacy for the rights of *campesinos,* as well as on behalf of indigenous groups, gained visibility and political agency in Ecuador. Various social movements coalesced in Ecuador in the early 2000s including those which advocated for the formal recognition of special rights for indigenous peoples specifically and for *campesino* communities more generally. As discussed in Chapter 3 of the thesis, many of these groups united under the banner of the Citizens' Revolution, on whose platform Rafael Correa won the 2006 presidential election.

During his first presidential campaign, Correa promised that one of his first actions in office would be to initiate the framing of a new, populist constitution that would, among other elements, better incorporate the historically marginalised perspectives of indigenous and campesino peoples. This promise was effectively realised when a Constituent Assembly[554] was held from November 2007 until October 2008. The formation of the Constituent Assembly was approved by nearly 82 per cent of the Ecuadorian voting populace, and the final text was ratified via referendum by approximately 64 per cent of voters in October 2008.[555]

The groups that had advocated on behalf of indigenous peoples and other *campesinos* considered the recognition of new "*buen vivir* rights" in the 2008

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[552] The top non-petroleum exports in Ecuador are bananas, shrimp, canned fish, flowers, and cacao. Instituto de Promoción de Exportaciones e Inversiones del Ecuador. (2018). "Análisis Exportaciones no Petroleras Ecuatorianas: Ene-May 2018." *Retrieved from* https://www.proecuador.gob.ec/informe-mensual-de-comercio-julio-2018/ (accessed 1 November 2018).

[553] One manifestation of this importance is the fact that in Ecuador between 80 and 90 percent of the seeds sown by smallholder farmers have been saved from prior harvests, obtained through exchanges with neighbouring communities, or acquired in local markets or seed fairs (Heifer-Ecuador 2015). This demonstrates that Ecuadorian *campesinos* are essentially self-reliant surrounding the production and procurement of seed, one of the principal agricultural inputs.

[554] Numerous civil society organizations participated in the 2007 Constituent Assembly, including the National Indigenous Confederation of Ecuador (*Confederación Nacional de Indígenas del Ecuador* – CONAIE); the National Federation of Indigenous and Afro-descendant Peasants of Ecuador (*Federación Nacional de Organizaciones Campesinas, Indígenas y Negras del Ecuador* – FENOCIN); the Ecuadorian Federation of Indigenous Evangelicals (*Federación Nacional de Indígenas Evangelicas* – FEINE); the National Affiliated Confederation of Peasant Social Security – National Peasant Coordination (*Confederación Nacional de Afiliados al Seguro Social Campesino – Coordinadora Nacional Campesina* – CONFEUNASSC-CNC); and the Nacional Confederation of the Quichua Community (*Confederación de los Pueblos de Nacionalidad de Kichua del Ecuador* – Ecaurunari).

[555] The Carter Center. (25 September 2008). Informe Final sobre el Referéndum Constitucional Aprobatorio de Ecuador del 28 de septiembre de 2008. *Retrieved from* https://www.cartercenter.org/resources/pdfs/news/peace_publications/election_reports/ecuador-referendum-report08.pdf.

Constitution to be a significant victory. Many of these organisations had participated directly in the drafting of the new constitutional text through the Constituent Assembly. The guarantees enshrined in the 2008 Constitution included new rights designed to protect the cultural identities of *campesinos* and indigenous peoples; access to land, water, and food; as well as the natural environment and national biodiversity. Given the breadth of the reforms, subsequent to the ratification of the 2008 Constitution debates have proliferated about how to rewrite existing, subordinate legal frameworks in order that they might conform to the new constitutional text. The subject matter that these reforms cover is vast, including laws governing culture,[556] finance,[557] higher education,[558] and citizen participation in policymaking.[559]

Following this trend, the *Ingenios* project was launched in 2014 based on the need to align the country's intellectual property law with the new, *buen vivir*-oriented national development paradigm that the 2008 Constitution was designed to support. Other lawmaking projects that have been undertaken in recent years also relate to issues of great importance for Ecuadorian farmers. These include the enactment of a new law for the protection of agrobiodiversity, seeds, and sustainable agriculture, as well as frameworks to regulate access to genetic resources and equitable benefit sharing,[560] and food sovereignty.[561]

Furthermore, one of the new regimes that is most pertinent to Ecuadorian agriculture is the section in the *Ingenios* Act that creates a system of intellectual property for plants in the form of plant breeders' rights. The importance of this chapter of the law is especially salient given the dualistic nature of the agricultural sector in Ecuador, where the interests of industrial and small-scale producers are starkly divided. While representatives of industrial agriculture regard plant breeders' rights as an important tool to incentivise research and development towards plant genetic improvement and to ensure return on investments,[562] *campesino* farmers are more

[556] *Ley Orgánica de Cultura* (2016), Registro Oficial No. 913.
[557] *Código Orgánico Monetario y Financiero* (2014), Registro Oficial No. 332.
[558] *Ley Orgánica de Educación Superior* (2010), Registro Oficial No. 298.
[559] *Ley Orgánica de Participación Ciudadana y Control Social* (2010), Registro Oficial No. 175.
[560] El Reglamento Nacional al Régimen Común sobre Acceso a los Recursos Genéticos en Aplicación a la Decisión 391 de la Comunidad Andina del Ecuador. Decreto Presidencial No. 905 (3 de octubre de 2011).
[561] Ley Orgánica del Régimen de la Soberanía Alimentaria del Ecuador. Registro Oficial Suplemento 583 (5 de mayo de 2009).
[562] Alejandro Martínez, President of Expoflores, Workshop on Ornamental Varieties, Technology Transfer and Innovation, "Management of Plant Varieties for Development," Yachay Tech, Urcuquí,

concerned with the maintenance and promotion of customary agricultural practices, including seed storage, exchange, and sale in local markets.[563]

Despite the differences between industrial and smallholder agricultural practices and how the new plant breeders' rights law might affect each group, as of 2018 intellectual property is not very relevant for food crops in Ecuador. The plant breeders' rights regime that the former, 1998 Intellectual Property Law established was used almost exclusively to protect ornamental plants. According to the most recent records available from the Ecuadorian Intellectual Property Institute, of the 291 plant varieties that were registered in the country as of 2016, 92 per cent were flowers.[564] Among the few food crops that were protected with breeders' rights in Ecuador, only two staples had been registered.[565] These were a pair of rice varieties, both of which were titled to a public agency, the National Agricultural Research Institute of Ecuador. Aside from these two varieties of rice, as of 2016 all of the breeder's rights certificates that had been granted for plants grown for food protected high value specialty crops such as artichokes, grapes, strawberries, mandarin oranges, and sugarcane, which were likely all designated for export.[566] Essentially all rights over protected varieties of plants in Ecuador were held by foreign entities.

During the making of the *Ingenios* Act, some civil society actors argued that given the national intellectual property landscape, food crops should be entirely excluded from intellectual property protection. However, in general, the privatisation of ornamental crops was not contested. For instance, as one advocate for *campesino* agriculture told me, "I am against intellectual property for seeds. If they are flowers…I think that is a question for the floriculturists. But if [intellectual property] gets involved in agriculture, it's very complicated."[567] It is noteworthy that the Ecuadorian officials involved in the making of the *Ingenios* Act considered this perspective when drafting the new chapter that would replace the plant breeders' rights framework that the 1998

Ecuador (25 April 2016) (recording on file with the author). Representative of Expoflores. (17 March 2016). Personal interview.

[563] Leader at the National Confederation of Peasant, Indigenous, and Black Organisations of Ecuador (FENOCIN). (3 May 2016). Personal Interview. Professor of Local Development at an Ecuadorian university. (15 April 2016). Personal interview.

[564] Lista de Variedades Vegetales Vigentes, Instituto Ecuatoriano de la Propiedad Intelectual, Dirección Nacional de Obtenciones Vegetales. Actualizado al 18 de noviembre de 2016. *Retrieved from* https://www.propiedadintelectual.gob.ec/obtenciones-vegetales/ (accessed 1 November 2018).

[565] *Id*.

[566] *Id*.

[567] Professor of Local Development at an Ecuadorian university. (15 April 2016). Personal interview.

Intellectual Property Law had created. One official from the Ecuadorian Intellectual Property Institute explained to me that the process of constructing the new framework was iterative:

> "[I]f I'm honest, we've had a movement of positions. First…it began originally with a regulation in terms of the 1978 Act [of UPOV]. And then…it was modified with the possibility of maintaining the norms from UPOV 1991 that are featured in the Andean Decision [No. 345]. Then…the possibility was analysed of creating a differentiated regime for ornamental and food varieties."[568]

Thus, the officials involved in the drafting of the texts that became the *Ingenios* Act considered certain innovative strategies for redesigning the Ecuadorian regime to regulate plants as intellectual property, such as creating a tiered system that would have mandated different criteria for the protection of ornamental plants on the one hand, and food crops on the other. Ultimately, this idea was not realised, largely due to the belief on the part of officials that such a system would not be viable given Ecuador's international obligations under the UPOV Convention and the Andean Community regional framework.[569] Nevertheless, the system for plant breeders' rights created in the *Ingenios* Act does deviate from these conventional models in certain ways. The novel elements of the law will be explored in the following two sections.

4.2. The Conceptualisation of the Plant Variety in the *Ingenios* Act

In order to understand how plants are conceived as the subject matter of intellectual property in the *Ingenios* Act, it is important to return to the new national governance model that the 2008 Constitution established. Indeed, one of the principal forces that motivated the reform of the Ecuadorian intellectual property regime as a whole was the need to institutionalise several of the novel guarantees that the new Constitution introduced. These included rights that are particularly relevant to agriculture, such as the right to food and other provisions designed to advance the "strategic objective" of food sovereignty. Additionally, the 2008 Constitution obligates the State to undertake a series of activities related to customary agricultural practices,

[568] Directorial level official from the Ecuadorian Intellectual Property Institute. (12 May 2016). Personal interview.
[569] *Id*.

including promoting smallholder production; avoiding the dependence on food imports; preserving and recovering national agrobiodiversity and ancestral knowledge; and ensuring that seeds may be freely used, saved, and exchanged.[570]

The intention to balance the exclusive, proprietary rights granted to plant breeders with other important national goals is visible in the section of the *Ingenios* Act concerned with intellectual property for plants. In this chapter, the subject matter eligible for protection is delimited as "varieties pertaining to all plant genera and species provided that the cultivation, possession or utilisation thereof is not prohibited for reasons of human, animal or plant health, food sovereignty, food security and environmental security."[571] The language is significant in that it renders the *Ingenios* Act as the only intellectual property law for plants in existence worldwide to explicitly invoke food sovereignty, in addition to food and environmental security as grounds to exclude certain varieties from protection.[572] This provision could potentially create a basis for the exclusion of certain varieties of plants from breeders' rights protection, for instance those which are derived from landraces and that are popularly grown for local consumption. Nevertheless, it is difficult to discern how these subject matter exclusions might operate in practice, given that they have not been tested in the courts of Ecuador or elsewhere.

A further innovation in the *Ingenios* framework is the specificity with which the law enumerates categories of plant varieties that are excluded from the ambit of plant breeders' rights. In comparison to the provisions of the 1998 Ecuadorian Intellectual Property Law, the *Ingenios* Act demonstrates a more nuanced and ecological understanding of the relationship between people and plants. Thus, in its definition of protectable subject matter, the *Ingenios* Act specifies that species may not be protected as intellectual property when: (1) they are in a "wild, natural or native state," (2) they "result from a mere discovery, except mutations," or (3) "there exists or is implied a process of plant improvement derived from the simple, symbiotic, long-term relationship between the species and human beings."[573] This explicitly recognises that plant genetic improvement is not a process that exclusively occurs through

[570] Constitución de la República del Ecuador de 2008, Art. 281.
[571] *Ingenios* Act, Article 471 (emphasis added).
[572] According to a search utilizing the keywords "food sovereignty" in all records in the WIPO Lex database of international intellectual property laws, 11 July 2018.
[573] *Ingenios* Act, Article 471.

professional breeding. Instead, humans and plants constantly interrelate and may co-evolve over the course of history.

The conceptualisation of the subject matter eligible for intellectual property protection is intended to recognise that farmers, in addition to professional scientists, act as plant breeders.[574] Further, the language employed in the *Ingenios* Act suggests that the law is inviting farmers to register as intellectual property the varieties that they develop. This may be possible because although plant varieties that result from a *simple* symbiotic, long-term relationship between the species and a person or people are expressly excluded from protection, the implication is that varieties resulting from a *complex* symbiotic long-term relationship would be protectable.

Research on participatory plant breeding conducted with smallholder famers has concluded that farmers are often motivated by diverse goals when they select and re-plant the seed and other propagating material of varieties that have desirable traits. Among other motivations, small-scale producers often intentionally engage in selection towards the ends of changing or conserving crop genetic variation.[575] Under the terms of the *Ingenios* Act, such activity could conceivably be understood as a complex symbiotic, long-term relationship, or in other words, breeding.

The intention of the *Ingenios* Act to recognise farmers as plant breeders due to their role in plant genetic improvement is evident in other sections of the law. For instance, the creation of a new plant variety is defined as

> "the resulting of a new variety through the application of scientific methods through conventional and non-conventional plant breeding techniques; *and the empirical method based on experimentation and observation that farmers undertake to obtain improved varieties and varieties that are better adapted to their local reality,* such as those obtained by natural mutations, provided that they comply with the requirements [for protection]."[576]

Here, farmers are explicitly conceived as agents who interact with the natural environment, and whose intellectual contributions shape that environment in ways that create value. This language represents a more expansive approach in comparison to

[574] Directorial level official at the National Service for Intellectual Rights. (19 October 2018). Personal interview.
[575] Soleri, D. & Cleveland, D. A. (2004). Farmer Selection and Conservation of Crop Varieties. In R. M. Goodman (Ed.). *Encyclopaedia of Plant and Crop Science*. Boca Raton, USA: CRC Press, Taylor & Francis Group. pp. 433-438.
[576] The *Ingenios* Act, Art. 472 (emphasis added).

the UPOV Convention, which defines a "breeder" as "the person who bred, or discovered and developed, a variety.[577]

However, notwithstanding the various ways in which the *Ingenios* Act attempts to recognise farmers as breeders, it is unclear whether actors other than professional plant breeders could realistically meet the requirements for protection to obtain rights under the new law for the varieties that they develop or improve. There are two primary reasons for this uncertainty. First, it is generally understood that genetic variation within and among farmers' plant varieties is much greater than is the case with varieties developed by professional breeders.[578] In addition, the growing environments in which farmers operate are usually more variable in space and time. Thus, it may be unlikely that farmers' varieties would be able to meet the UPOV-based uniformity and stability requirements for protection that the *Ingenios* Act reinscribes.

Second, farmers' plant varieties may not comply with the requirement of novelty. This is because small-scale farmers in Ecuador, as in many countries, customarily exchange seeds with others. For instance, a farmer may develop a plant variety that is never sold commercially, but the farmer may still make the variety available to others through the customary practice of seed exchange. If such transactions were to occur for a period of time greater than one year prior to the date of filing of the application for plant breeders' rights, the farmer's variety would not be novel under the *Ingenios* Act. This is because it is likely that in such cases the existence of the variety would meet the definition of common knowledge.[579]

Some other countries have recognised farmers as plant breeders in *sui generis* intellectual property laws for plants. Countries with such legislation already in place include India,[580] Thailand,[581] and Malaysia.[582] In contrast to the system that the *Ingenios* Act institutes, these three countries have all created separate categories for the protection of farmers' plant varieties on the one hand, and commercial or professional breeders' varieties on the other. As of 2018, other governments, including

[577] UPOV 1991, Art. 1.
[578] Cleveland & Soleri, *supra* note 209. *See also* Salazar, Louwaars, & Visser, *supra* note 318.
[579] For instance, UPOV 1978 states that common knowledge "may be established by reference to various factors such as: cultivation or marketing already in progress…." (Art. 6(1)(a)).
[580] The Protection of Plant Varieties and Farmers' Rights Act of India (2001).
[581] Plant Varieties Protection Act of Thailand, B.E. 2542 (1999).
[582] Protection of New Plant Varieties Act of Malaysia, Act 634 (2004).

those of Sri Lanka[583] and Nepal,[584] were also weighing the possibility of enacting similar legislation. The basis for the creation of a typology of plant varieties is the recognition that farmers may be conceptualised as breeders, but that the UPOV-based requirements for protection may be difficult for farmers to meet.

Under these *sui generis* systems of intellectual property for plants, farmers are usually required to meet relatively less stringent requirements for protection in comparison to commercial or professional plant breeders. The rationale for requiring farmers to meet relatively laxer criteria than professional breeders is that members of this latter group are typically able to access sophisticated scientific tools, as well as the time and resources with which to conduct controlled breeding experiments towards the development of new, distinct, uniform, and stable plant varieties. In contrast, farmers' efforts to effect plant genetic improvement customarily occur in the field, in parallel with other agricultural activities such as planting, harvesting, and seed sorting. Furthermore, trait selection by farmers is commonly based on phenotypic observation, while professional plant breeders may utilise advanced genetic techniques to obtain new varieties.

The Ecuadorian officials involved in the making of the *Ingenios* Act were aware of the precedents set by certain other countries, especially the exhaustively studied case of the Indian Protection of Plant Varieties and Farmers' Rights Act of 2001.[585] Nevertheless, the new Ecuadorian legislation does not separately categorise breeders' and farmers' plant varieties. Instead, the *Ingenios* Act reinscribes the UPOV-derived novelty, distinctness, uniformity, and stability criteria for the protection of all types of plant varieties as intellectual property. Although numerous other provisions were modified in the *Ingenios* Act as compared to the 1998 Intellectual Property Law, these requirements for protection remained essentially unaltered.

The genealogy of the new Ecuadorian system of intellectual property for plants reveals that the criteria for protection that the *Ingenios* Act mandates have retained their essential form over time, dating to the first, 1961 version of the UPOV Convention. This lineage is the logical result of Ecuador's obligations under UPOV 1978, which

[583] Perera, A. (2011). Plant Variety Protection in Sri Lanka and its Impact on Sri Lanka's Agricultural Economy: A Critical Analysis. *The Journal of World Intellectual Property, 14*(3-4), 301-333.
[584] Jefferson, D. J. & Adhikari, K. (in prep). Food Sovereignty as a Foil to Intellectual Property for Plants? Lessons from Ecuador and Nepal. *Journal of Agrarian Change.*
[585] Director level official from the Ecuadorian Intellectual Property Institute (IEPI). (12 May 2016 and 6 July 2016). Personal interview.

stipulates that Member States may not grant proprietary rights to plant breeders based on conditions other than novelty, distinctness, uniformity, and stability.[586] Although Ecuadorian officials were able to experiment with certain doctrinal provisions during the making of the *Ingenios* Act*,* the criteria for protection were non-negotiable, at least at the level of legislation.

However, understanding how the novelty, distinctness, uniformity, and stability requirements might operate in practice under the new Ecuadorian regime involves a deeper level of analysis than simply reading the text of the law. Even though the *Ingenios* Act did not create separate criteria for the registration of farmers' plant varieties, officials were aware of the space to innovate that existed in the regulatory, if not in the legislative realm. The existence of this opportunity for experimentation is evidenced in the General Regulations to the *Ingenios* Act, released via presidential decree in May 2017. This framework stipulates that

> "The competent authority in matters of intellectual [property] rights shall ensure the compliance with the principle of equality established in the Constitution of the Republic of Ecuador, *guaranteeing the recognition of farmers' rights*. For the [evaluation of applications] for varieties obtained through the empirical method based on experimentation and observation that farmers realise, *the same requirements as for varieties obtained through classical or modern plant biotechnological methods shall not be applied*."[587]

According to the General Regulations, although the UPOV-based novelty, distinctness, uniformity, and stability requirements for protection were not altered in the *Ingenios* Act, Ecuadorian officials should not assess farmers' plant varieties according to the same standards as varieties developed by professional breeders. As one official from the National Service for Intellectual Rights explained to me, this provision was included in recognition that farmers who obtain new plant varieties via mass selection are not able to provide the same kind of scientific documentation as professional breeders who create new varieties via hybridisation or genetic engineering.[588] However, specific criteria for how farmers' varieties should be assessed for plant breeders' rights protection were not elaborated in the General

[586] UPOV 1978, Art. 6.2.
[587] Reglamento General al Código Orgánico de la Economía Social de los Conocimientos, Creatividad e Innovación. Decreto Presidencial No. 1435. (23 de mayo de 2017) Pg. 14 (emphasis added).
[588] Director level official from the National Service for Intellectual Rights of Ecuador. (19 October 2018). Personal interview.

Regulations. As of 2018, it remained unclear whether these details would be clarified in the Technical Regulations, which at that point remained in draft form.

The process of formulating the *Ingenios* Technical Regulations began publicly in October 2017, when the newly formed National Service for Intellectual Rights organised a public dialogue in which 170 representatives from universities, technical institutes, public research institutions, law firms, non-profit organisations, and private businesses participated. At this event, government officials solicited comments from participants regarding the subject matter that would be addressed in the forthcoming administrative framework, including in relation to scientific research, intellectual property, and access to genetic resources.[589]

The comments received during the October 2017 event were incorporated into a first draft of the *Ingenios* Technical Regulations, written by officials at the National Service for Intellectual Rights. In July 2018, the text of the draft was published in its entirety on an online platform, with sets of provisions enumerated for the various forms of intellectual property, including trademarks, patents, copyright, traditional knowledge, and plant breeders' rights.[590] A period of public comment was opened from July to September 2018, and during this time, users were able to submit comments directly through the online platform.

Following the period of public comment, the digital platform was taken offline. After reviewing the inputs received, the National Service for Intellectual Rights organised a series of roundtable discussions, to which it invited everyone who provided comments through the online platform.[591] Certain individuals who were unable to access the website in time but who still wanted to give feedback were also welcomed to attend the meetings. The roundtable discussions were organised by thematic area, such that different individuals attended specific meetings related to traditional knowledge protection, trademarks, patents, copyright, and plant breeders' rights, respectively. Subsequently, the National Service for Intellectual Rights worked to compile all of the comments received via the online platform and the roundtable

[589] Secretaría de Educación Superior, Ciencia, Tecnología e Innovación. (31 de octubre de 2017). El Código Ingenios se fortalece con la participación ciudadana. Boletín de Prensa No. 143. *Retrieved from* https://www.educacionsuperior.gob.ec/el-codigo-ingenios-se-fortalece-con-la-participacion-ciudadana/.
[590] Servicio Nacional de Derechos Intelectuales del Ecuador. "Borrador de Reglamento por Temas." *Retrieved from* http://www.paiecuador.ec/aporte_normativa/index.php (accessed 22 August 2018).
[591] Director level official from the National Service for Intellectual Rights of Ecuador. (19 October 2018). Personal interview.

discussions to generate a new draft of the Technical Regulations. As of late 2018, it was unclear whether the next version would be the final one. It was also not known whether the new draft would also be submitted to another round of public comments, though one senior official intimated to me that many members of the National Service for Intellectual Rights hoped that this would occur.[592]

The most recent available version of the *Ingenios* Technical Regulations does not specify whether the testing process to evaluate distinctness, uniformity, and stability would be different for farmers' plant varieties on the one hand and those developed by professional plant breeders on the other. This lack of differentiation contrasts with the express stipulation of the General Regulations that the assessment of farmers' plant varieties should not be subjected to the same requirements as for varieties obtained through classical or modern plant biotechnological methods. One option to address this discrepancy could be to specify in the Technical Regulations that farmers' plant varieties would only *generally* need to meet the criteria of uniformity or stability. Such a strategy has been considered in other countries, including Nepal.[593] As of late 2018, officials in the National Service for Intellectual Rights were weighing this option, and in any event, they made it clear to me that they intended to create a system that would encourage farmers to protect the varieties that they develop.[594]

Regardless of the approach that the Ecuadorian policymakers decide to follow, the UPOV Convention should not constrain their ability to experiment with local definitions of the distinctness, uniformity, and stability requirements for plant breeders' rights protection. This is because the Convention does not provide precise, technical definitions of the criteria for protection, offering only vague, general descriptions of these concepts. For instance, uniformity is determined to exist when a variety is "sufficiently uniform in its relevant characteristics,"[595] but the meaning of "sufficiently uniform" is not elaborated. Notably, what constitutes "sufficiently uniform" differs from one species of plant to another.

Due to the difficulty of translating the exact parameters of uniformity into technical terms to guide field-testing, UPOV allows signatories to the Convention to develop their own national-level regulatory frameworks. This means that the *Ingenios*

[592] *Id*.
[593] Draft Bill on Plant Variety Protection and Farmers' Rights of Nepal. Section 28(1)(b) and 28(1)(c).
[594] Director level official from the National Service for Intellectual Rights of Ecuador. (19 October 2018). Personal interview.
[595] UPOV 1991, Art. 8.

Technical Regulations could ostensibly recognise different definitions of distinctness, uniformity, and stability for farmers' and professional breeders' plant varieties. Acknowledging the ambiguities involved in translating concepts such as uniformity and stability into bureaucratic protocols, the UPOV Council has developed a set of guidance documents to help Member States to better navigate the complexity of conducting field-testing. However, the character of these documents is informative, and they state explicitly, "[t]he only binding obligations on members of the Union are those contained in the text of the UPOV Convention itself."[596] In other words, national governments are free to define distinctness, uniformity, and stability in a manner that would be best suited to locally relevant conditions of the various species of plants that are cultivated within their borders.

Notwithstanding this formal legal space, the idea of defining the distinctness, uniformity, and stability criteria differentially based on the identity of the applicant for plant breeders' rights is experimental. The UPOV Council has never expressly addressed this issue, although UPOV guidance documents elaborate various methods for the evaluation of uniformity and stability based on the rationale that variation in the expression of relevant characteristics within varieties has both genetic and environmental components.[597] At least a few territories have already experimented with the idea of defining separate registration requirements for breeders' versus farmers' plant varieties. For instance, as mentioned above the draft plant variety protection law of Nepal does not create separate categories for farmers' varieties on the one hand and professional breeders' varieties on the other. However, in recognition that farmers' varieties frequently originate from native or local varieties whose traits are often expressed heterogeneously,[598] under the proposed Nepali framework farmers' varieties would only be expected to "generally" meet the criteria of uniformity and stability to receive protection.[599]

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[596] UPOV. General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions. UPOV Document TG/1/3 (19 April 2002). Chapter 1.3.
[597] UPOV. (2008). Examining Uniformity. Associated Document to the General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants. Document TGP/10/1; UPOV (2011). Examining Stability. Associated Document to the General Introduction to the Examination of Distinctness, Uniformity and Stability and the Development of Harmonized Descriptions of New Varieties of Plants. Document TGP/11/1.
[598] Halewood, M. (Ed.). (2016). *Farmers' Crop Varieties and Farmers' Rights: Challenges in Taxonomy and Law*. Abingdon, UK: Routledge.
[599] Plant Variety Protection Bill of Nepal, Section 28.1.b and c.

The strategy that Ecuador could undertake in the *Ingenios* Technical Regulations is similar to the approach under consideration in Nepal. If the *Ingenios* Technical Regulations were written to mandate different acceptable ranges of uniformity and stability for farmers' varieties on the one hand and those developed by professional breeders on the other, it might be more likely that farmers' varieties could meet the conditions for intellectual property protection. The question of whether such a differentiated approach would be compliant with the UPOV Convention will be explored further in Chapter 5 of the thesis. Chapter 5 will also consider the relevance of the *Ingenios* case study for countries other than Ecuador that are legally bound to reinscribe the UPOV model. Meanwhile, the next section will dissect other areas in which the *Ingenios* Act deviates from the conventional plant breeders' rights paradigm, highlighting examples of innovative and locally adaptive lawmaking.

4.3. Reforming or Conforming? The *Ingenios* System for Intellectual Property in Plants

The system of intellectual property for plants that the *Ingenios* Act establishes generally tracks the framework initially created in Decision No. 345 of the Andean Community. This in turn means that the *Ingenios* law essentially mirrors the basic parameters of the 1978 version of the UPOV Convention. The UPOV administration previously evaluated Decision No. 345 and determined that the Andean Community regime is compliant with the 1978 version of the Convention.[600] Thus, the relevant inquiry for the purposes of this thesis is, to what extent does the *Ingenios* Act conform to or deviate from the Andean Community framework? While the two regimes are similar, certain substantive and intriguing differences exist between Decision No. 345 and the *Ingenios* system for the regulation of plants as intellectual property. These distinctions are illustrative of the attempt by Ecuadorian lawmakers to exploit the lacunae in the Andean Community and UPOV models.

One area in which the *Ingenios* Act substantially departs from the template provided in Decision No. 345 concerns instances where the breeder's authorisation is not required for use of a protected variety. Decision No. 345 expressly limits plant breeders' rights protection such that the right-holder's authorisation is not needed to

[600] *See* UPOV. (17 March 2009). Examination of the Conformity of the Legislation of Peru with the 1991 Act of the UPOV Convention. C(Extr.)/26/2.

use protected varieties for experimental purposes.[601] The *Ingenios* Act also contains this provision, but the new law expands the subject matter covered by exempting from infringement acts that are conducted for the purposes of teaching or for scientific or academic research.[602] While this change may appear to be minor, the exception for the use of protected plant varieties for teaching could have benefits for students and farmers alike. This could be the case if varieties registered with plant breeders' rights were used as the basis for academic instruction or in agricultural extension services.

Similarly, the *Ingenios* Act expands the exceptions to plant breeders' rights to include the use of protected varieties by farmers – the so-called farmer's privilege – under a variety of circumstances. The *Ingenios* Act and Decision No. 345 both specify that plant breeders' rights do not include the ability to prevent third parties from using a protected variety for private, non-commercial purposes; for experimental purposes; or for the breeding or exploitation of a new variety.[603] However, the *Ingenios* system enlarges the ambit of the farmer's privilege such that farmers are specifically permitted to use intellectual property protected plant varieties for several additional purposes. These include reproduction and exchange with other farmers for the purposes of multiplication of seed or other propagating material, on the condition that such activities do not extend to production for commercial purposes.[604]

Additionally, under the *Ingenios* Act farmers may use plants protected as intellectual property for an array of purposes in the context of "ancestral agricultural practices or in a traditional communitarian ambit," including selling or exchanging seeds or other material derived from a protected variety.[605] The exception for certain commercial activities is an important deviation from the UPOV Convention. The 1978 and 1991 versions of the Convention both limit the permitted unauthorised use of protected plant varieties to non-commercial acts. Therefore, this provision of the *Ingenios* framework stands out as a significant attempt to rebalance the interests of

[601] Decisión No. 345, Art. 25.
[602] *Ingenios* Act, Art. 490.
[603] *Compare* Decisión No. 345 at Art. 25 with *Ingenios* at Art. 490.
[604] *Ingenios* Act, Art. 490(4).
[605] Decisión No. 345, Art. 26. Note that the meaning of "selling" in this context is limited to the "traditional communitarian ambit," which would be considered a non-commercial activity under the UPOV 1978 conceptualisation of the farmers' privilege. However, sale of a protected variety without the authorisation of the right holder would not be permitted under UPOV 1991, even within the traditional communitarian sphere. Salazar, Louwaars, & Visser, *supra* note 318.

plant breeders with those of farmers, in recognition of the realities of how customary agriculture is practiced in Ecuador.

Further differences between the Andean Community legislation and the new Ecuadorian regime relate to when the intellectual property rights of plant breeders are considered to be exhausted. Decision No. 345 does not include any language related to exhaustion, nor do the 1961/1972 or 1978 versions of the UPOV Convention, though exhaustion provisions do appear in UPOV 1991.[606] For its part, the *Ingenios* Act extensively enumerates situations in which plant breeders' rights may be considered to be exhausted. Thus, the rights granted under the *Ingenios* framework do not include the ability to prevent third parties from using the protected material once it has been introduced into the stream of commerce of any country with the consent of the breeder, his licensee, or a person economically linked to the breeder or licensee.[607]

In contrast to the *Ingenios* system, the 1991 version of the UPOV Convention limits exhaustion such that plant breeders' rights do not extend to acts concerning material of a protected variety that has been commercialised "in the territory of the Contracting Party concerned."[608] This provision is much broader in the *Ingenios* Act, given that the breeder is not able to prevent third parties from using the protected material once this material has been introduced into the stream of commerce of *any country*. It could be argued that the *Ingenios* Act has taken advantage of policy space that appears in Decision No. 345, which provides that Member States of the Andean Community "may adopt means to regulate or control in their territories, the production or the commercialisation, importation or exportation of the reproductive or multiplying material of a variety," so long as these measures do not impede or repudiate the proprietary rights of plant breeders.[609] However, it is also possible that the exhaustion provisions in the *Ingenios* Act could be challenged under UPOV 1978, which stipulates that "[t]he free exercise of the exclusive right accorded to the breeder may not be restricted otherwise than for reasons of public interest."[610]

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[606] UPOV 1991, Art. 16.
[607] Such acts must imply (1) commercialisation of the variety as reproductive or multiplying material; or (2) exportation of the material of the variety for the purposes of reproduction, to a country that does not protect varieties of the genus or species to which that variety pertains. *Ingenios*, Art. 468.
[608] *Id*.
[609] Decisión No. 345, Art. 28.
[610] UPOV 1978, Art. 9(1).

In addition to expanding the exceptions to the plant breeders' rights, the *Ingenios* Act also develops certain ideas that Decision No. 345 includes but outlines in relatively more conservative terms. This phenomenon is illustrated by comparing the respective regimes' provisions on compulsory licensing. Decision No. 345 generally permits compulsory licenses to be granted, such that in "exceptional cases of national security or public interest, the National Governments may declare [a protected plant variety] freely available, on the basis of equitable compensation for the breeder."[611]

In contrast, under the *Ingenios* Act, a comprehensive compulsory licensing framework allows for the liberation of protected varieties under several specifically enumerated circumstances. These include for reasons of public interest, national emergency or security;[612] anticompetitive practices;[613] or when the right holder of a patent cannot commercially exploit a patented invention without utilising the protected variety.[614] Although the *Ingenios* framework substantially enlarges the grounds based on which compulsory licenses may be granted, the law still attempts to comply with an express obligation that UPOV 1978 contains. The relevant provision specifies that where the proprietary rights of a plant breeder are restricted to permit the widespread distribution of the protected variety, the government "shall take all measures necessary to ensure that the breeder receives equitable remuneration."[615]

While the *Ingenios* Act expands certain basic provisions of Decision No. 345, the new Ecuadorian regime also introduces novel measures in an attempt to align the country's system of plant breeders' rights with other laws related to the regulation of different types of plants. These include the applicable domestic and regional frameworks for access to plant genetic resources and equitable benefit sharing. Since 1996, the Andean Community has governed issues of access and benefit sharing at the regional level, through Decision No. 391.[616] Where the Andean Community plant breeders' rights legislation does not include provisions on access and benefit sharing,

[611] Decisión No. 345, Art. 30.
[612] *Ingenios* Act, Art. 476.
[613] *Ingenios* Act, Art. 479.
[614] *Ingenios* Act, Art. 480.
[615] UPOV 1978, Art. 9(2).
[616] Comunidad Andina. Decisión No. 391 que establece el Régimen Común sobre Acceso a los Recursos Genéticos (2 de julio de 1996).

the *Ingenios* Act seeks to amalgamate intellectual property for plants with the spirit of Decision No. 391.

For instance, the *Ingenios* system includes nullity provisions that are designed to remedy violations of the access and benefit sharing law. Thus, plant breeders' rights may be declared null and void if a copy of the access agreement is not presented, when the protected variety has been developed based on genetic resources sourced from Ecuador or other Andean Community Member States.[617] It is unclear whether this provision could be challenged as exceeding the parameters for nullity outlined in UPOV 1978. This version of the UPOV Convention allows governments to declare the breeder's right to be null if "he does not provide the competent authority with the reproductive or propagating material [or] the documents and the information necessary for checking the variety."[618] The meaning of "necessary documents and information" could arguably be construed to include the access agreement, though "checking the variety" in the UPOV context likely refers to conducting testing for distinctness, uniformity, and stability rather than verifying the provenance of source material used for plant breeding.

Furthermore, it is notable that UPOV 1978 does not allow plant breeders' rights to be annulled except on the grounds enumerated in the UPOV Convention.[619] The UPOV Council has previously expressed its support for laws regulating access to genetic resources and equitable benefit sharing, stating that

> "UPOV encourages the principles of transparency and ethical behaviour in the course of conducting breeding activities and, in this regard, the access to the genetic material used for the development of a new variety should be done respecting the legal framework of the country of origin of the genetic material."[620]

However, the UPOV Council has also emphasized that issues related to access and benefit sharing are outside of the scope of the UPOV Convention. As the Council has specifically stated, "The competent authority for the grant of the breeder's rights is not in a position to verify whether the access to genetic material has taken place in

[617] *Ingenios* Act, Art. 474.
[618] UPOV 1978, Art. 10(3)(a).
[619] UPOV 1978, Art. 10(4).
[620] UPOV (23 October 2003) "Access to Genetic Resources and Benefit-Sharing: Reply of UPOV to the Notification of June 26, 2003, from the Executive Secretary of the Convention on Biological Diversity (CBD)." Adopted by the Council of UPOV at its thirty-seventh ordinary session. Pg. 3.

accordance with the applicable law in this field."[621] This statement suggests that UPOV might consider the nullity language included in the *Ingenios* Act to exceed the scope of the Convention, although the UPOV Council has not published any guidance documents on this issue.

In addition, UPOV has unequivocally stated that "the UPOV Convention requires that the breeder's right should not be subject to any further or different conditions than the ones required to obtain protection."[622] This means that according to the 1978 version of the Convention,[623] UPOV signatories cannot require the access agreement to be presented as a requirement for the grant of the breeder's right. In the *Ingenios* Act, Ecuadorian lawmakers have circumvented this limitation by requiring the access agreement to be presented not as a condition to obtain intellectual property, but under a separate and independent legal regime.[624] Thus, failure to present a copy of the access agreement is conceptualised as a violation of the access and benefit sharing law, not as a failure to comply with the requirements for plant breeders' rights. This is a clever attempt to exploit the available formal policy space while remaining compliant with UPOV 1978.

A further area in which the *Ingenios* Act deviates from the Andean Community framework relates to the question of whether plant breeders' rights should be extended to cover essential derived varieties. This concept is defined in Decision No. 345 such that

> "[A] variety shall be deemed to be essentially derived from an initial variety when it originated therefrom or from a variety itself essentially derived from the initial variety and it retains the expression of the essential characteristics that result from the genotype or combination of genotypes of the original variety, and which although distinguishable from the initial variety, nevertheless conforms to it in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety, except with respect to differences resulting from the derivation process."[625]

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[621] *Id*.
[622] *Id*.
[623] UPOV 1978, Art. 6(2).
[624] Decreto Presidencial No. 905. El Reglamento Nacional al Régimen Común Sobre Acceso a los Recursos Genéticos en Aplicación a la Decisión 391 de la Comunidad Andina.
[625] Decisión No. 345, Art. 3.

It is notable that Decision No. 345 does not require Andean Community Member States to offer protection for essentially derived varieties, but rather merely offers national authorities the option to do so.[626]

The concept of the essentially derived variety was introduced for the first time in the 1991 version of the UPOV Convention. The inclusion of this concept within the scope of plant breeders' rights was designed to respond to advances in molecular breeding techniques and biotechnology that occurred throughout the 1980s and 1990s, which facilitated more rapid and precise development of new plant varieties. In this context, there was concern that protected varieties could be "plagiarised," that "copycat breeding" would occur, or that "mimic," "imitation," or merely "cosmetic" varieties would be developed and protected with plant breeders' rights by parties other than the original breeder.[627] Although since 1991, language related to essentially derived varieties has been incorporated into numerous national level intellectual property laws for plants, there is still considerable confusion over how to determine a suitable threshold for essential derivation.[628]

By eliminating essentially derived varieties from the scope of intellectual property protection, the *Ingenios* Act avoids the difficulties inherent in determining how to regulate this concept pragmatically. However, the Ecuadorian government has also separately argued that exploiting the notion of essential derivation could offer a mechanism for protection against the misappropriation of farmers' plant varieties,[629] which may be used as source material in breeding programs. Indeed, some scholars have suggested that the concept of essentially derived varieties could be extended beyond plant varieties protected by patents or breeders' rights to also include those which are listed in registers of farmers' varieties. Under such a paradigm, authorisation from the farmer would be required to develop new plant varieties if the farmer's variety were used as initial breeding material.[630]

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[626] *Id*., Art. 24(i).
[627] Lawson, *supra* note 317.
[628] *Id*. *See also* Sanderson, J. (2006). Essential Derivation, Law and the Limits of Science. *Law Context: A Socio-Legal Journal, 24*, 34.
[629] Ministerio de Comercio Exterior del Ecuador. (11 de mayo de 2016) "Protección de los derechos de los agricultores y de las variedades vegetales en el Acuerdo Comercial Multipartes." Ficha No. 5. *Retrieved from* http://www.comercioexterior.gob.ec/wp-content/uploads/downloads/2016/11/5.-Ficha-Proteccio%CC%81n-de-los-derechos-de-los-agricultores-y-de-las-variedades-vegetales-en-el-ACM-16-11-2016.pdf.
[630] Salazar, Louwaars, & Visser, *supra* note 318.

There is no obligation under either Decision No. 345 or the 1978 version of the UPOV Convention to include essentially derived varieties in the new Ecuadorian intellectual property law for plants. As such, the *Ingenios* Act is in compliance with its international obligations surrounding essential derivation of protected plant varieties. However, the decision not to include essentially derived varieties in the *Ingenios* Act could represent a missed opportunity to take advantage of the available formal policy space to expand the ambit of protection for farmers' plant varieties.

Overall, in comparison to the international obligations to which Ecuador is subject, the embodiment of plants as intellectual property in the *Ingenios* Act contains several distinct features. These include the expansion of the farmer's privilege, the enumeration of new grounds on which the proprietary rights of plant breeders might be exhausted or declared null, and the enlargement of the grounds on which compulsory licenses may be granted. Additionally, the 2017 General Regulations to the *Ingenios* Act utilised the formal policy space available at the administrative level, by differentiating between breeders' and farmers' plant varieties for the evaluation of distinctness, uniformity, and stability.

Together, these measures in the *Ingenios* Act represent an attempt to balance the rights of plant breeders with other important policy goals. The provisions discussed above exploit ambiguities and lacunae that exist in the 1978 version of the UPOV Convention and in Andean Community Decision No. 345. Furthermore, in some instances the substance of the *Ingenios* Act probes the limits of lawmaking for the regulation of plants as intellectual property under these international agreements. The Act is generally careful not to undermine its treaty obligations directly, except for one obvious discrepancy with Decision No. 345 concerning the duration of plant breeders' rights protection. Under the Andean Community framework, Member States must grant a term of protection "from 20 to 25 years for the case of vines, forest and fruit trees including their rootstocks and, from 15 to 20 years for all other species."[631] Under the *Ingenios* system, only 18 years of protection are provided for vines, forest, fruit and ornamental trees.[632] To further complicate the matter, the minimum periods of protection provided in the *Ingenios* Act are the same as those mandated under UPOV 1978, at 18 years for vines, forest, fruit and ornamental trees and 15 years for all other

[631] Decisión No. 345, Art. 21.
[632] *Ingenios*, Art. 461.

species.[633] Thus, although the *Ingenios* Act conforms to UPOV 1978, Ecuador could be challenged within the Andean Community for non-compliance with the minimum standards established in Decision No. 345.

Similarly, Ecuador could eventually witness a confrontation between the system of intellectual property for plants that the *Ingenios* Act establishes and the parameters of the 2016 EU-Ecuador free trade agreement. As discussed in Chapter 1 of the thesis, the intellectual property section of this trade agreement states that the other parties to the treaty – including the European Union, Colombia, and Peru – "shall cooperate to promote and ensure the protection of plant varieties based on [UPOV], as revised on 19 March 1991."[634] However, a footnote associated with the same article states that "[a]t the moment of signature of this Agreement, [UPOV 1978] applies for Ecuador."[635]

If Ecuador were pressured to revise the new system for plant breeders' rights that the *Ingenios* Act has established, numerous provisions might need to be reformed to meet the minimum standards mandated under the 1991 version of the UPOV Convention. Discrepancies to be addressed could include the periods of protection for registered plant varieties, the farmer's privilege, exhaustion of the breeder's right, nullity, and protection for essentially derived varieties. For instance, the minimum periods of protection mandated in UPOV 1991 are 25 years from the grant date for trees and vines and 20 years for all other species.[636] As discussed above, the periods of protected granted under the *Ingenios* Act are 18 years for vines, forest, fruit and ornamental trees and 15 years for all other species.

Likewise, the farmers' privilege that the *Ingenios* system recognises would likely need to be curtailed if Ecuador were required to comply with UPOV 1991. As currently written, the *Ingenios* Act contains exceptions to plant breeders' rights for use of protected varieties "for non-profit sale or exchange of the product [of the variety] as raw material or food."[637] Also exempted are uses of protected plant varieties "in the context of ancestral agricultural practices or in a traditional agricultural communitarian sphere," including the non-profit sale or exchange of such varieties.[638] In contrast,

[633] UPOV 1978, Art. 8.
[634] Trade Agreement Between the European Union and its Member States, of the One Part, and Colombia and Peru, of the Other Part. Art. 232.
[635] *Id*. at FN 72b.
[636] UPOV 1991, Art. 19.
[637] *Ingenios* Act, Art. 488(2).
[638] *Id*. at Art. 488(3).

UPOV 1991 only provides a limited "optional exception" that signatory countries can incorporate into their national plant breeders' rights laws. This version of the farmer's privilege allows UPOV 1991 Member States to,

> "within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder's right in relation to any variety in order to permit farmers to *use for propagating purposes, on their own holdings*, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety."[639]

This provision is substantially more limited than the current farmer's privilege provision of the *Ingenios* Act, which extends far beyond farmer's own holdings to protect traditional agricultural practices that occur at the interpersonal and community levels.

Additionally, if the *Ingenios* Act were required to conform to the parameters of the 1991 version of the UPOV Convention, the current exhaustion provisions would need to be amended. Under UPOV 1991, "the breeders' right does not extend to acts concerning any material of the protected variety…which has been sold or otherwise marketed by the breeder or with his consent in the territory of the Contracting Party concerned."[640] The conceptualisation of exhaustion in the *Ingenios* Act is much broader, declaring that the proprietary rights of plant breeders do not include "the right to stop a third party from realising acts with respect to the material of [the breeders'] variety…after this material has been introduced into the [stream of] commerce of any country with the consent of the owner, a licensee, a person economically linked to the owner or licensee, or any other authorised person."[641] This provision effectively permits the parallel importation of protected plant varieties. In other words, if a plant variety that is protected in Ecuador were sold in another country, seed from this variety could ostensibly be imported into Ecuador and sold there without the consent of the right-holder. Such an effect could increase Ecuadorian farmers' access to foreign germplasm, but it is not a model that is compatible with the UPOV 1991 framework.[642]

A further discrepancy between UPOV 1991 and the *Ingenios* Act is that the latter allows for plant breeders' rights to be nullified "if a copy of the access agreement has not been presented, when the variety has been obtained or developed through

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[639] UPOV 1991, Art. 15(2) (emphasis added).
[640] *Id*. at Art. 16(1).
[641] *Ingenios* Act, Art. 492.
[642] *See* Jaffer & Van Wijk, *supra* note 291.

genetic resources or the products thereof derived from those for which Ecuador or any of the Andean Community member countries is the country of origin."[643] No such language is included in UPOV 1991. UPOV officials and independent scholars alike have affirmed that there is no inherent incompatibility between the UPOV system and the various international treaties relating to access and benefit sharing (i.e., the Convention on Biological Diversity, the Nagoya Protocol, and the Plant Treaty).[644] However, as of 2018 the UPOV Council had not specifically commented on whether the failure to include a copy of the access agreement would be appropriate grounds for nullifying plant breeders' rights under the terms of the Convention. Finally, and as noted above, if the *Ingenios* Act were required to be revised to conform with UPOV 1991, the provisions concerning essentially derived varieties – which were formerly included in the 1998 Ecuadorian Intellectual Property Law – would need to be reinstated.

During the making of the *Ingenios* Act, the officials involved in generating drafts of the law were acutely aware of the various international obligations to which Ecuador is subject. Commensurately, these actors were also familiar with the regimes to which Ecuador currently does not need to conform, especially UPOV 1991. When drafting and marketing the text of the *Ingenios* Bill, lawmakers consistently invoked the notion of "cognitive capitalism," which they alleged was promoted through international alliances with wealthy capitalist countries, including via free trade agreements. One of the principal visionaries behind the *Ingenios* Act contended that such treaties, as well as the global "ratcheting-up" of intellectual property minimum standards, have subjected Ecuador "to an [intellectual property] system that induces dependence on knowledge generated in countries in the North."[645] In its section on intellectual property for plants, the *Ingenios* Act attempts to resist cognitive capitalism by counterbalancing plant breeders' rights with protections for other actors, including small-scale farmers.

At the same time, the *Ingenios* Act essentially recapitulates the model for intellectual property for plants that the UPOV Convention establishes. This fact illustrates the extent to which the logic of plant breeders' rights has influenced lawmakers' perceptions of the imaginaries available, even in a country where officials

[643] *Ingenios* Act, Art. 498(3).
[644] *See, e.g.,* Button, *supra* note 183; Lawson, C. (2015). The Breeder's Exemption under UPOV 1991, the Convention on Biological Diversity and its Nagoya Protocol. *Journal of Intellectual Property Law & Practice, 10*(7), 526-535.
[645] Ramírez, *supra* note 447.

were well aware of the formal legal space that existed in the context of treaty obligations. While it is true that Ecuador is legally bound to the UPOV Convention, officials could have experimented with the plant breeders' rights template to a greater extent than was the case during the making of the *Ingenios* Act. For instance, and as discussed in Chapter 2 of the thesis, Ecuador could have established a separate system for the protection of different types of plant varieties, such as those developed by smallholder farmers. Similarly, lawmakers could have created a system that would only protect ornamental plants and not food crops. This is because UPOV 1978 only requires that member countries offer plant breeders' rights for at least twenty-four botanical genera or species in total.[646]

One example of how the standard approach to intellectual property for plants has influenced the Ecuadorian *Ingenios* Act is visible in how lawmakers have conceptualised national development. Although Citizens' Revolution officials regularly proclaimed the desire to institutionalise an "alternative to development"[647] encapsulated in policies that espouse *buen vivir*, in practice this concept has been mobilised in the service of conventional strategies designed to promote economic growth.[648] A concrete manifestation of this trend was the execution of the 2016 free trade agreement with the European Union – an instrument that contains stricter minimum standards for intellectual property than those to which the country was previously subject – a mere one month before the *Ingenios* Act became law.

This contradiction illustrates the complexity of interests at play in Ecuador's attempt to remake its system of intellectual property for plants according to a truly local design. On the one hand, the *Ingenios* Act essentially reproduces the conventional assumption that intellectual property should be conceived as a tool for development through the incentivisation of innovation. However, in recent years Ecuador has simultaneously advanced an ambitious legislative agenda designed to regulate the uses of plant genetic resources according to alternative rationalities. These include systems to govern the conservation of agrobiodiversity, the circulation of seeds, and

[646] International Convention for the Protection of New Varieties of Plants (revised October 23, 1978), Art. 4(3)(b)(iii).
[647] Gudynas, E. (2011). Buen Vivir: Germinando Alternativas al Desarrollo. *América Latina en Movimiento, 462*, 1-20. Acosta, A. (2013). *El Buen Vivir: Sumak Kawsay, Una Oportunidad para Imaginar Otros Mundos*. Barcelona: Icaria. Gudynas, E. & Acosta, A. (2011). La Renovación de la Crítica al Desarrollo y el Buen Vivir como Alternativa. *Utopía y Praxis Latinoamericana, 16*(53).
[648] Escobar, *supra* note 527. Wilson & Bayón, *supra* note 527.

the protection and promotion of traditional knowledge. The following two sections will discuss recent Ecuadorian lawmaking projects related to these various subjects.

4.4. Seed Law as an Alternative to Intellectual Property for Plants

Although intellectual property laws represent important legal means to structure the ability of various social actors to access and use different types of plants, other regimes are also relevant to these activities. Frameworks that regulate the control and circulation of seeds are particularly impactful for the governance of plant genetic resources for food and agriculture. The significance of seed laws is based on the fact that seeds perform many functions in agriculture. Seeds act as carriers of genetic diversity, as key inputs for crop production, as commodities that can be traded, and in many instances, as expressions of culture and as embodiments of traditional knowledge.[649]

Notably, seed laws and policies do not necessarily follow the same logic as systems that grant plant breeders' rights. While it is true that in many countries seed laws have historically focused on stimulating private enterprise – a goal similar to those frequently associated with plant breeders' rights legislation – in more recent years attention has shifted to strengthening integrated seed systems.[650] Generally, these paradigms are designed to support the parallel and mutually supportive development of seed generated by professional plant breeders and multipliers on the one hand, and by small-scale farmers on the other.

In Ecuador, national programs designed to support both industrial and smallholder agricultural production simultaneously have been launched in recent years. For instance, in 2012 the national Ministry of Agriculture unveiled an "Integrated Project for Sustainable Agricultural, Environmental, and Social Development," whose purpose was to implement comprehensive systems of agricultural production by blending modern technologies with customary practices.[651] Concurrently, the need to recognise new rights and protections for indigenous and *campesino* peoples emerged

[649] Louwaars, N. P., Le Coent, P., & Osborn, T. (2011). Seed Systems and Plant Genetic Resources for Food and Agriculture. FAO Thematic Background Study.
[650] Louwaars, N. P. (Ed.). (2010). *Seed Policy, Legislation and Law: Widening a Narrow Focus*. Boca Raton, USA: CRC Press.
[651] Ministerio de Agricultura y Ganadería del Ecuador. (n/d). "PIDAASSE." *Retrieved from* https://www.agricultura.gob.ec/pidaasse/ (accessed 5 November 2018).

at the forefront of national politics. This phenomenon materialised in the 2008 Constitution, which contains numerous new guarantees related to environmental conservation and management, customary agricultural practices, and the protection and promotion of traditional knowledge.

In some ways, the new system of intellectual property for plants that the *Ingenios* Act establishes is motivated by these same priorities, although as discussed above, the law is based essentially on the conventional model for plant breeders' rights. Nevertheless, it is significant that the *Ingenios* regime recognises a series of protections for farmers, allowing the use of intellectual property-protected plants without the authorisation of the right-holder for "personal use"; "selling or exchanging, for non-profit purposes, the product as raw material or food"; and "in the context of ancestral agricultural practices or within the scope of traditional communitarian agriculture, including the non-profit sale or exchange of seeds or other material from the variety."[652] Furthermore, the *Ingenios* Act expands the concept of the farmers' privilege beyond the Andean Community regime and the former 1998 Ecuadorian Intellectual Property Law, such that farmers may use the material from varieties protected by third parties for the purposes of multiplication or for exchange with other farmers, provided that these activities do not occur at a commercial scale.[653]

Thus, in some ways the *Ingenios* Act deviates from the UPOV Convention model for plant breeders' rights. However, the Act does not go so far as to conceptualise intellectual property for plants according to a typology of different kinds of plants that would be subject to different forms of protection, as the laws of certain other countries such as India, Thailand, and Malaysia have done. Some of these systems grant intellectual property for plant varieties developed by professional breeders on the one hand and for those developed by farmers or communities on the other. Meanwhile, other laws recognise a form of protection for wild-type plants, as a means to prevent misappropriation of natural agrobiodiversity. Such frameworks, while perhaps not intellectual property in the conventional sense, may enable a country to comply with various international obligations simultaneously – including those provided in the TRIPS Agreement, the UPOV Convention, the Convention on

[652] *Ingenios* Act, Art. 489.
[653] *Id.*, Art. 490.

Biological Diversity, the Nagoya Protocol, and the Plant Treaty – while also realising multiple national policy goals.

Although the *Ingenios* Act does not contain these kinds of provisions, Ecuador has nonetheless sought to address complex issues inherent to the realities of the national agricultural sector in other recently enacted laws. One of these new regimes is the Law for Agrobiodiversity, Seeds, and the Promotion of Sustainable Agriculture[654] (hereafter referred to as the 2017 Seed Law) – which could in some ways represent an alternative to intellectual property as a means to govern the uses of plants for agricultural purposes. In contrast to similar legislation that was previously in place in Ecuador and which remains in force many other countries, the 2017 Seed Law does not merely provide a system of quality control for seeds that circulate in national markets. Instead, the new regime endeavours to synthesise diverse goals, including promoting organic agriculture, ensuring the conservation and sustainable use of plant genetic resources, protecting customary agricultural practices, and guaranteeing food security and food sovereignty.

Scholars and activists alike criticised the first generation national seed laws in the Andean region, arguing that these regimes subordinated customary agricultural practices to industrial systems for crop production by consolidating control over the flow and uses of seeds.[655] Particular concern revolved around the fact that the requirements for registration and certification in these laws were frequently too strict for the seeds of native or local (landrace) plant varieties to meet. If the seeds of landrace varieties are not registered but continue to be used, seed laws can effectively marginalise or even criminalise customary seed management practices.[656] Critics linked the first generation Ecuadorian seed law to the country's experience with the "Green Revolution," which they claim was characterised by the expansion of crop monocultures, as well as the proliferation of seeds that require significant inputs of chemical fertilisers and pesticides.[657]

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[654] Ley Orgánica de Agrobiodiversidad, Semillas y Fomento de la Agricultura Sustentable (hereafter "2017 Seed Law"). (8 de junio de 2017). Registro Oficial No. 10, Órgano del Gobierno del Ecuador.
[655] Bravo, E., Álvarez, T., Armendáris, E., & Almeida, A. (2014). *En el Laberinto de las Semillas Hortícolas: Una Visión desde la Ecología Política*. Quito, Ecuador: Abya-Yala.
[656] *Id*.
[657] Conferencia Plurinacional e Intercultural de Soberanía Alimentaria (COPISA) (2012) "Un Nuevo Modelo Agrario para el Ecuador: Propuesta de Ley Orgánica de Agrobiodiversidad, Semillas y Fomento Agroecológico.

Ecuador has operated a system for seed certification since 1978, the year in which the country's first seed law was enacted.[658] This framework divided seeds into two essential categories: certified seed and common seed.[659] The law explicitly subjected certified seed to greater oversight by the Seed Certification Department than common seed,[660] ostensibly leaving space for the commercialisation of the seed of landrace plant varieties within customary farmer-to-farmer networks. However, once implemented, the 1978 law effectively required that all seed sold in Ecuador be registered and subjected to quality control standards.[661] While this requirement was not routinely enforced against farmers, in the decades following the enactment of the 1978 Seed Law, Ecuadorian activists demanded that the framework be rewritten in a way that would more explicitly recognise and promote customary agricultural practices.[662]

Movements to reform the 1978 Ecuadorian Seed Law culminated in 2009 with the creation of the Plurinational and Intercultural Conference for Food Sovereignty (a/k/a the "Food Sovereignty Conference"). This group worked for several years – in collaboration with over 500 local civil society organisations[663] – on a proposal for a new law that would embody multiple themes important to the forms of agriculture practiced in Ecuador, including agrobiodiversity conservation, the promotion of "agroecological" practices, and seed regulation.[664] The proposal that the Food Sovereignty Conference developed was comprised of five key objectives: (1) to conserve and promote agrobiodiversity, farmer seed, and the knowledge associated therewith; (2) to incentivise agroecological practices; (3) to conduct participatory research, training, education, and extension within the framework of the dialogue of knowledges; (4) to regulate the production and certification of industrial seeds, and to guarantee that Ecuador will remain a territory free of transgenic plants; and (5) to foment a new "institutionality" and greater social participation.[665]

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[658] Ley No. 2509, Ley de Semillas de 1978.
[659] *Id.* Art. 3.
[660] *Id*. Art. 42.
[661] GRAIN. (2014) Leyes de Semillas y Otros Pesares: Los Pueblos de América Latina las Cuestionan e Impugnan. *Retrieved from:* https://www.grain.org/es/article/categories/518-leyes-de-semillas-y-otros-pesares.
[662] *Id*.
[663] COPISA, *supra* note 657.
[664] *Id*.
[665] *Id*.

In 2012, the Food Sovereignty Conference proposal for a holistic new framework encompassing agrobiodiversity, agroecology, and seed regulation was submitted to the Ecuadorian National Assembly, forming one inspiration for the initial draft of the 2017 Seed Law. The Bill stalled for several years in the legislature, but it was reanimated in 2016. During this period, a pre-legislative consultation about the draft Seed Bill was opened, and the Food Sovereignty Conference filed a pronouncement based on comments that were compiled through consultations with nearly 700 organisations and institutions across the country.[666]

This pronouncement contained seven key points, many of which reiterated the themes introduced in the initial Food Sovereignty Conference proposal. Specifically, Ecuadorian *campesinos*, indigenous groups, and their supporters requested that the 2017 Seed Law: (1) recognise ancestral and farmer seeds as farmers' heritage; (2) incentivise and promote organic agriculture and agroecology; (3) promote the use of ancestral and farmer seeds; (4) guarantee the free flow and exchange of such seeds; (5) protect agrobiodiversity and ancestral seeds; (6) comply with the constitutional mandate that establishes Ecuador as a country free of transgenic seeds; and (7) promote research and education within the framework of the dialogue of knowledges.[667]

These principal themes formed the basis for discussions between legislators, *campesino* organisations, and community members during the pre-legislative consultation process, which included local meetings held in all of Ecuador's twenty-four provinces. According to surveys conducted and published by the National Assembly, 87 per cent of participants in the pre-legislative consultations agreed with the substantive components of the draft Seed Bill, particularly in relation to the protection of traditional agricultural knowledge, agrobiodiversity, and the regulation of native seed.[668] Prominent legislators involved with the making of the new law

[666] El Telégrafo. (25 de noviembre del 2016). "Copisa presentará propuestas para la Ley de Semillas." *Retrieved from* http://www.eltelegrafo.com.ec/noticias/economia/8/copisa-presentara-propuestas-para-la-ley-de-semillas.
[667] *Id*.
[668] Carvajal A., M. (21 de abril del 2017). Informe para Segundo Debate del Proyecto de Ley Orgánica de Agrobiodiversidad, Semillas y Fomento Agroecológico. Oficio No. CSADSAP-P-2017-01028.

highlighted the importance of these themes, especially in relation to protecting *campesinos'* customary agricultural practices.[669]

Ultimately, the new Law for Agrobiodiversity, Seeds and Promotion of Sustainable Agriculture was enacted in June 2017. The principal objectives of the framework are

> "[T]o protect, revitalise, multiply, and invigorate agrobiodiversity in relation to plant genetic resources for food and agriculture; ensure the production, free and permanent use of seeds of quality and variety, through the promotion and scientific investigation and the regulation of models for sustainable agriculture; respecting the diverse identities, knowledge and traditions towards the end of guaranteeing the self-sufficiency of healthy, diverse, nutritious and culturally appropriate foods to achieve food sovereignty and contribute to *Buen Vivir* or *Sumak Kawsay*."[670]

This statement of purpose expressly reflects many of the policy priorities that the Food Sovereignty Conference had promoted.

One of the most significant features of the new law is that it "guarantees the free use, production, promotion, conservation and exchange of *campesinos'* seed, which comprises native and traditional seed."[671] In addition, the law establishes an individual and collective "right to the free production, conservation, commercialisation, exchange and access to all classes of native, traditional, and certified seed."[672] This right is reinforced in one of several guarantees related to *campesino* agriculture, which provides that farmers may "conserve on their holdings, utilise, exchange, and commercialise their planting or propagating material."[673] Finally, the law obligates the State to "preserve, produce, regenerate, conserve, revitalise, distribute, promote, and facilitate the use, free exchange, and consumption, in a sustainable manner, [of] agrobiodiversity and native and *campesino* seeds."[674]

These guarantees are significant because they take *campesinos'* customary agricultural practices seriously. The 2017 Seed Law recognises the contributions that

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[669] TV Legislativa Noticias (10 de octubre del 2016). Entrevista a Mauricio Proaño, Vicepresidente de la Comisión de Soberanía Alimentaria. *Retrieved from* https://www.youtube.com/watch?v=tzAoV1xLmSk
[670] 2017 Seed Law, Art. 1.
[671] *Id*.
[672] *Id*. Art. 8(b).
[673] *Id*. Art. 9(b).
[674] *Id*. Art. 14(b).

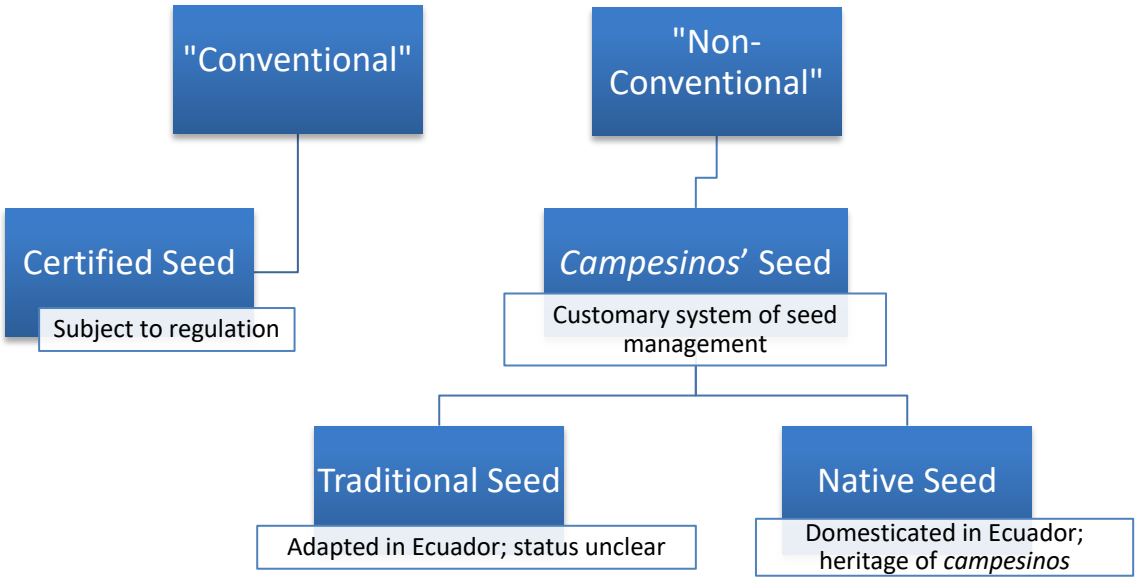
small-scale farmers have made and continue to make to ensure national food security, as well as to conserve Ecuadorian agrobiodiversity. The protections granted for customary seed management practices thus advance the *buen vivir* agenda of the government, by respecting *campesino* and indigenous ways of life and valuing these peoples' contributions to modern Ecuadorian society.

Nevertheless, it is important to recognise that the 2017 Seed Law amalgamates these policy priorities with an otherwise conventional system for seed certification. In so doing, the legislation is designed to satisfy the demands of indigenous peoples and groups of small-scale farmers without deviating from strategy that the Citizens' Revolution government propounded to reconfigure the national economy. Therefore, although *campesino* seeds are granted protection under the 2017 Seed Law, the framework also supports the use of modern biotechnological methods to realise goals such as the development of "high performance crops," which is one of the tactics that the government has advocated for changing the productive matrix of Ecuador.[675]

In order to differentiate between *campesino* and industrial forms of agriculture, the 2017 Seed Law creates a typology of seeds (*see* Figure 8). The 2017 Seed Law differentiates between two systems of seed production: non-conventional and conventional. The first of these is conceptualised as a "traditional system practiced by natural or legal persons, collectives, communes, communities, peoples, and nationalities that produce, reproduce, exchange, commercialise, lend, and maintain their own seeds, under multiple modalities,"[676] or in other words, *campesino* agriculture. Meanwhile, the conventional seed system is based on seed certification and subject to State regulation,[677] which is representative of industrial agriculture.

[675] Wilson & Bayon, *supra* note 527 at 58.
[676] 2017 Seed Law, Art. 25(a).
[677] *Id*. Art. 25(b).

Figure 8: Typology of Seeds in the 2017 Ecuadorian Seed Law



The non-conventional seed system is concerned entirely with *campesinos'* seed (*semilla campesina*), a category that is further divided into two classifications: native seed and traditional seed. The former is defined as

> "[A]ll sexual and asexual plant reproductive material that maintains its capacity of reproduction, original or autochthonous, that has been domesticated, conserved, raised, cared for, utilised and exchanged by producers, communes, communities, peoples and nationalities in accordance with their diverse knowledge and cultures, whose use, conservation, conditioning, exchange, promotion and protection correspond to people and collectives with the support of the State."[678]

Meanwhile, the definition of traditional seed essentially tracks the conceptualisation of native seed, except that traditional seed is not original or autochthonous, but "has been adapted, conserved, cared for, utilised, cultivated and exchanged by producers, communes, communities, peoples and nationalities."[679]

The distinction between native and traditional seed can be illustrated by comparing crops such as quinoa and rice. Quinoa is indigenous to the Andean

[678] *Id*. Art. 28.
[679] *Id*. Art. 31.

region,[680] and therefore this grain is classified as a native seed under the new law. In contrast, while rice was not domesticated in Ecuador, it has been cultivated in the territory that is now located within the country's borders since at least the end of the eighteenth century.[681] Rice thus falls into the category of traditional seed.

The separation of native and traditional seed into two distinct categories based on the historical origins of a given species may be convenient for the purposes of lawmaking. However, science on plant genetics has long questioned the validity of the concept of "centres of origin" for certain crops, which may not have in fact originated in these centres.[682] Furthermore, for the purposes of protecting *campesino* agricultural practices, the distinction between native and traditional seeds may be counterproductive. This is evidenced by the fact that international instruments such as the Plant Treaty enact protections for customary agricultural practices based on the recognition that indigenous and traditional farmers have made an "enormous contribution" to the conservation and development of *all* plant genetic resources used for food and agriculture, regardless of where a particular species was domesticated.[683]

Thus, the rationale behind granting differential protections for native versus traditional seeds is difficult to discern. When I asked one member of the staff of a legislator who had worked on the project about why lawmakers decided to create two separate categories of *campesino* seed, she responded frankly that she did not know the reason.[684] One key difference between these native and traditional seed is that the law recognises the former as "heritage (*patrimonio*) of [Ecuadorian] peoples and nationalities, [which] is part of the genetic resources for food and agriculture," and may not be misappropriated.[685] In contrast, traditional seed is not considered to form part of the heritage of Ecuadorian farmers, which also means that traditional seed is not explicitly protected from misappropriation.

The 2017 Seed Law likewise guarantees that the National Agrarian Authority will promote the organisation of seed fairs and other spaces for the exchange and

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[680] Tapia, M. E. & Fries, A. M. (2007) *Guía de Campo de los Cultivos Andinos.* Roma: Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO).
[681] Instituto Nacional Autónoma de Investigaciones Agropecuarias (INIAP). (2007) Manual del Cultivo de Arroz. Manual No. 66. Guayas, Ecuador.
[682] Harlan, J. T. (1971) Agricultural Origins: Centers and Noncenters. *Science, 174*(4008), 468-474.
[683] *See* International Treaty on Plant Genetic Resources for Food and Agriculture. (2009). Art. 9.
[684] Legislative staff for an Assemblyperson at the Ecuadorian National Assembly. (16 October 2018). Personal interview.
[685] 2017 Seed Law, Art. 28.

commercialisation of native seeds,[686] in addition to creating campaigns, mechanisms of stimulus, and incentives so that "peoples and nationalities protect, conserve, use and reproduce native seeds."[687] The law is silent as to whether traditional seed would also be included in these events and programmes. These are curious and potentially detrimental discrepancies, especially given that traditional but non-native crops such as rice, barley, maize, and fava bean are critical for food security and food sovereignty in Ecuador.[688]

Meanwhile, the reformist language that characterises the introductory sections of the 2017 Seed Law is not always reflected in the substantive provisions of the legislation. Although one of the goals of the framework is to strengthen the use, conservation, and free exchange of native and traditional seeds,[689] these categories of seed would need to meet phytosanitary requirements in order to enter into the conventional seed market.[690] Furthermore, the law permits transgenic seeds and crops to enter into the country, provided that these materials are used solely for research purposes.[691] The potential uses of genetically modified organisms are narrowly drawn in the new law, and the State is explicitly obligated to "monitor and control the condition of the country as a territory free of transgenic seeds and crops."[692]

The allowance of the importation of transgenic seeds and crops solely for research purposes is consistent with the objectives of the Citizens' Revolution government. Government officials who were in office during the Correa presidency regularly expressed interest in developing a "bioeconomy" through the marriage of modern biotechnological tools with Ecuadorian native biodiversity.[693] However, critics allege that this goal fundamentally contradicts the *buen vivir* worldview, because of its continued orientation towards commercialisation and economic growth.[694]

Indeed, based on misgivings about the 2017 Seed Law, four lawsuits were filed immediately following the enactment of the regime in June 2017. The plaintiffs – who

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[686] *Id*. at Art. 29.
[687] *Id*. at Art. 30.
[688] Moreano B., M. (2001) Perfil Nutricional de Ecuador. Roma: Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO).
[689] 2017 Seed Law, Art. 5(d).
[690] *Id*. at Art. 32.
[691] *Id*. at Art. 56.
[692] *Id*. at Art. 14(i).
[693] Granizo, T. and Ríos, M. (2011). *Aprovechamiento Económico del Bioconocimiento, los Recusos Genéticos, las Especies y las Funciones Ecosistémicas en el Ecuador*. Ministerio Coordinador de Patrimonio. Quito.
[694] Wilson & Bayon, *supra* note 527.

were the organisations Ecological Action, Ecuarunari, the Confederation of Indigenous Nationalities of Ecuador, and the Ecuador Free of Transgenics Collective – contended that the law violates the 2008 Ecuadorian Constitution.[695] The 2008 constitutional framework declares the country to be "free of transgenic crops and seeds," a prohibition that can only be subverted in cases of "national interest dually established by the President of the Republic and approved by the National Assembly."[696] The continued controversy illustrates the misgivings of *campesino* and indigenous groups, who have wondered whether the aspiration of the 2017 Seed Law to realise *buen vivir* has been subordinated to the interests of industrial agriculture.[697]

It is still too early to assess the potential impact of the 2017 Seed Law on the form of customary agriculture that many Ecuadorian farmers practice, given that as of 2018 the legislation had not yet been implemented. The question of whether the framework can engender parity between small-scale and industrial agricultural systems remains to be answered. Although the new framework expressly incorporates several of the points listed in the Food Sovereignty Conference proposal, certain conceptual ambiguities exist within the law. In addition to the issues raised above, it is notable that the primary purpose of the regime is to institutionalise a system that essentially conforms to the realities of industrial agriculture. This orientation is evidenced by the continued emphasis on seed certification and regulation, which reiterates the focus of the 1978 Seed Law.

Furthermore, the 2017 Seed Law in some ways situates *campesino* agricultural practices historically rather than contemporarily. This is evidenced by the terminology that the law employs. The *campesino* seed system is conceptualised as "non-conventional" while the industrial seed system enjoys the default position of "conventional." Such language may be accurate in North America or Europe where industrial agriculture produces the majority of the food that residents consume. However, in Ecuador, where the majority of the food consumed is sourced locally from

[695] La Hora. (3 de junio de 2017). "Preparan en Ecuador demanda contra Ley de Semillas." *Retrieved from* https://lahora.com.ec/noticia/1102063343/noticia (accessed 4 September 2017); La Hora. (13 de julio de 2017). "Tercera demanada de inconstitucionalidad en contra de Ley de Semillas." *Retrieved from* https://www.lahora.com.ec/noticia/1102084195/tercera-demanda-de-inconstitucionalidad-en-contra-de-ley-de-semillas (accessed 4 September 2017).
[696] Constitución de la República del Ecuador de 2008, Art. 401.
[697] La Hora. (6 de mayo de 2017). "Colectivo indígena de Ecuador muy preocupado por Ley de Semillas." *Retrieved from* https://lahora.com.ec/noticia/1102055605/colectivo-indc3adgena-de-ecuador-muy-preocupado-por-ley-de-semillas (accessed 4 September 2017).

family farmed plots, many of which depend heavily on native and traditional seeds, the characterisation of *campesinos'* seed as non-conventional is both ironic and inaccurate.

Notwithstanding these limitations, the 2017 Seed Law contains several provisions that concretely advance policy goals related to the protection and promotion of customary agricultural practices. In addition to guarantees related to access and use of seeds, the law establishes a series of individual and collective rights related to agrobiodiversity conservation and food security. These include the right to free production, commercialisation, and consumption of healthy, nutritious, and diverse foods; the right of communities, peoples, and nationalities to the recognition and valorisation of ancestral and traditional knowledge linked to agrobiodiversity and the production of seeds; and the right to participation in decision making surrounding agrobiodiversity.[698]

These provisions actualise many of the international obligations that Ecuador has assumed under instruments governing the uses of plant genetic resources, especially the Plant Treaty. Specifically, this regime requires that contracting Parties should take measures to promote "farmers' rights" through certain enumerated provisions. These include the protection of traditional knowledge relevant to plant genetic resources for food, and the right to participate in making decisions at the national level on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.[699]

In addition to granting a series of rights to actors involved in the national agricultural sector, the 2017 Seed Law creates a set of duties that the government is bound to uphold. These obligations include guaranteeing the conservation of agrobiodiversity; preserving, producing, regenerating, conserving, revitalising, distributing, promoting, and facilitating the use and free exchange of native and farmer seed; and guaranteeing individual and collective rights to the conservation, storage, production, improvement, access, free circulation, commercialisation, and export of seeds.[700] Finally, the State has the duty to shield ancestral and traditional knowledge

[698] 2017 Seed Law, Art. 8.
[699] International Treaty on Plant Genetic Resources for Food and Agriculture. (2009). Art. 9.2.
[700] 2017 Seed Law, Art. 14.

from misappropriation, and to ensure that these ways of knowing are promoted, alongside of customary agricultural practices and technologies.[701]

Overall, the 2017 Seed Law functions as a complement to the system for the governance of plants as intellectual property that the *Ingenios* Act establishes. Although like the *Ingenios* Act the 2017 Seed Law in some ways evidences the extent to which rationalities of scientific innovation, proprietisation, and commercialisation have influenced imaginaries for lawmaking, the legislation is also concerned with the realisation of other national policy goals related to the usage of agricultural and food plants. For instance, the 2017 Seed Law grants a series of rights to farmers in relation to certain categories of seeds. These guarantees are designed to ensure that *campesinos* may continue to engage in customary farming practices, such as seed saving, replanting, and exchange.

Notably, the 2017 Seed Law does not conceive of *campesino* seed according to an individualistic, proprietary logic. In contrast to the plant variety protection laws of countries such as India, the new Ecuadorian seed legislation does not establish a mechanism through which individual farmers or farmer cooperatives might register new varieties that they develop. Instead, the 2017 Seed Law conceptualises native seed as Ecuadorian farmers' heritage, a recognition that does not follow the rationality of exclusivity. Although the regime could have gone further by establishing the same kind of protection for traditional seed, the 2017 Seed Law nevertheless represents an innovative, alternative means to enact *sui generis* legislation for the realisation of national goals related to the governance of different types of plants.

However, one important distinction between intellectual property laws for plants and frameworks such as the new Ecuadorian Seed Law is the fact that the latter is primarily concerned with the regulation of physical plant materials, namely seeds. In contrast, intellectual property laws are supposed to offer protection that extends to ideas or inventions. Although the 2017 Seed Law does recognise the right of Ecuadorian farmers and indigenous peoples to the recognition, valuation, and protection of the traditional knowledge that they possess in relation to plants and seeds,[702] the legislation does not elaborate how this guarantee should be effectuated. For this reason, it will be interesting to return to the *Ingenios* Act in the following

[701] *Id*.
[702] *See* 2017 Seed Law, Art. 8(d), 10(d), 14(b), 14(c), 14(e), 14(n), 14(p), 14(r), 23, and 28.

section, to explore how Ecuadorian lawmakers have imagined a new form of protection for traditional knowledge derived, in part, from the standard intellectual property model.

4.5. Traditional Knowledge Protection as an Alternative to Conventional Intellectual Property Law for Plants

The trend towards the rendering of traditional knowledge[703] in possessive terms – whether or not according to the standard rationality of intellectual property – has become increasingly visible in recent years, both in Latin America and worldwide. For instance, the World Intellectual Property Organization (WIPO) regularly convenes an Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, which for years has attempted to create an international legal instrument for the protection of traditional knowledge. At present, no such global framework exists. In 2018, the Intergovernmental Committee announced that a draft treaty should be finalised by 2020.[704] However, the formation of this prospective regime has been fraught, and the viability of the Voluntary Fund that finances the participation of indigenous peoples in the negotiations has been jeopardised on several occasions.[705]

In the absence of a multilateral treaty, certain regional intergovernmental organisations have created frameworks for the governance of traditional knowledge, usually according to a proprietary logic similar to that which is associated with conventional forms of intellectual property. These regional instruments include the Secretariat of the Pacific Community with its Regional Framework for the Protection of Traditional Knowledge and Expressions of Culture[706] and the Swakopmund Protocol

[703] Note that although the terms "traditional knowledge" and "indigenous knowledge" may mean different things in distinct applications, I use them interchangeably for the purposes of the thesis.
[704] Assemblies of Member States of WIPO Fifty-Seventh Session. Agenda Item 18: Matters Concerning the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (2-11 October 2017). *Retrieved from* http://www.wipo.int/export/sites/www/tk/en/igc/pdf/igc_mandate_2018-2019.pdf.
[705] Saez, C. "WIPO Traditional Knowledge Committee Begins Work on Core Issues; Indigenous Peoples May be Left Out." *Intellectual Property Watch,* (27 August 2018). *Retrieved from* http://www.ip-watch.org/2018/08/27/wipo-traditional-knowledge-committee-begins-work-core-issues-indigenous-peoples-may-left/. Saez, C. "Do WIPO Delegations Want Indigenous Peoples' Participation?" *Intellectual Property Watch,* (8 July 2014). *Retrieved from* http://www.ip-watch.org/2014/07/08/do-wipo-delegations-want-indigenous-peoples-participation/.
[706] Secretariat of the Pacific Community (SPC), Regional Framework for the Protection of Traditional Knowledge and Expressions of Culture, 2002.

of the African Intellectual Property Organization.[707] At the national level, some countries have enacted laws to protect indigenous knowledge based on two general models.

The first typically involves the compilation of a State-administered database, which can be used to defeat applications for conventional forms of intellectual property based on lack of novelty. WIPO classifies these repositories of traditional knowledge as mechanisms for "defensive protection."[708] Meanwhile, WIPO characterises the second general model as one that offers "positive protection." Such systems are designed to prevent the unauthorised use of traditional knowledge, as well as potentially to promote the commercial exploitation of such knowledge by "legitimate possessors."[709]

Among the few territories to have experimented with a more nuanced approach to the governance of traditional knowledge is Ecuador. Indeed, the chapter on traditional knowledge protection is among the most innovative parts of the *Ingenios* Act, in that it is not based on pre-existing international models. Structurally, the traditional knowledge framework forms the final part of Book 3 of the Act, which is entitled "Of the Management of Knowledge." Book 3 is entirely concerned with the protection of "intellectual rights," which according to the *Ingenios* paradigm constitute both intellectual property and traditional knowledge.[710]

Thus, under the new Ecuadorian model protections for traditional knowledge are not expressly rendered according to the language of property. Instead, the *Ingenios* Act recognises intellectual property and traditional knowledge as parallel and coequal systems for the management of different ways of knowing, towards the objective of "promoting scientific, technological, artistic, and cultural development, as well as incentivising innovation."[711] Furthermore, the *Ingenios* Act specifically intends to function as a mechanism "to preserve and perpetuate the traditional knowledge of communities, peoples, nationalities and communes, procuring the expansion thereof and protecting it from illegitimate commercial appropriation."[712]

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[707] African Regional Intellectual Property Organization (ARIPO), Swakopmund Protocol on the Protection of Traditional Knowledge and Expressions of Folklore (2010).
[708] *Traditional Knowledge*, World Intellectual Property Organization. *Retrieved from* http://www.wipo.int/tk/en/tk/.
[709] *Id.*
[710] *Ingenios* Act, Art. 85.
[711] *Id*.
[712] *Id*., Art. 511.

Although the term "traditional knowledge" suggests an historical rather than contemporary appreciation of indigenous, alternative, or subaltern[713] cosmologies, the *Ingenios* Act acknowledges that such knowledge holds continued contemporary relevance for Ecuadorian society. This understanding of traditional knowledge as dynamic, vital, and constantly evolving is further reinforced by the intentions expressed in the framing language of the *Ingenios* Act. This section recalls the 2008 Constitution, which "foresees that it shall be the responsibility of the State to facilitate and promote the incorporation of the society of knowledge to achieve the objectives of the development regime; promote the generation and production of knowledge, foment scientific and technological research, and strengthen [*potenciar*] traditional knowledge, to thus contribute to the realisation of *buen vivir*."[714] The general objectives of the *Ingenios* system also include "the rescue of ancestral knowledge."[715] This provision implies that certain forms of knowledge have been lost – or at least obfuscated or subjugated – but that such ways of knowing will be important for the actualisation of the new Ecuadorian "development regime."

The strategy for an alternative to development – or as critics of the Citizens' Revolution government allege, alternative development[716] – is encapsulated in the Second National Plan for *Buen Vivir* (2013-2017). This policy endeavours to realign the national development objectives according to principles derived from the concept *buen vivir*. The Second National Plan specifies that "*buen vivir* is the form of life that allows for happiness and the permanence of cultural and environmental diversity; it is harmony, equality, equity and solidarity. It is not to seek opulence or infinite economic growth."[717] The relationship between aspirations for national development and intellectual property is longstanding, and intellectual property has frequently been conceived as a tool for economic growth in conventional development narratives.[718] However, the *Ingenios* Act does not import this theory wholesale. Instead, the law

[713] For a description of subaltern knowledge and an argument for why its elevation should constitute a legislative priority, *see* de Sousa Santos, B. (2007). Para Além do Pensamento Abyssal: Das Linhas Globais a uma Ecologia de Saberes. *Novos Estudos*.
[714] *Ingenios* Act*, los Considerandos,* ¶2*.*
[715] *Id*.
[716] Merino, R. (2016). An Alternative to 'Alternative Development'?: Buen Vivir and Human Development in Andean Countries. *Oxford Development Studies, 44*(3), 271-286.
[717] Secretaría Nacional de Planificación y Desarrollo del Ecuador (SENPLADES). (2013) "El Plan Nacional del Buen Vivir (2013-2017)." Pg. 13.
[718] *See, e.g.,* Gould, D. M. & Gruben, W. C. (1996). The Role of Intellectual Property Rights in Economic Growth. *Journal of Development Economics, 48*(2) 323-350.

announces the intention to re-imagine the role of intellectual property in development, because development in this context is understood to mean something other than simply the accumulation of wealth. Under such a paradigm, indigenous ways of knowing attain renewed value, and thus the protection of traditional knowledge has been taken seriously in the *Ingenios* Act.

This newly institutionalised appreciation for indigenous peoples' knowledge contrasts with the former Ecuadorian intellectual property framework, which did not substantively recognise traditional knowledge as subject matter eligible for protection. The 1998 Intellectual Property Law only stated that "a *sui generis* system of collective intellectual rights of the local ethnicities and communities shall be established. The protection, mechanisms of valuation, and application thereof shall be subjected to a special law that shall be emitted for this effect."[719] However, no legal framework was ever elaborated under the 1998 Intellectual Property Law or any independent *sui generis* regime, until the incorporation of traditional knowledge protections into the *Ingenios* Bill in 2014.

The extensive participation of individuals and groups from indigenous and *campesino* communities in the 2007 Constitutional Constituent Assembly was catalysed into the legal recognition of collective rights over traditional knowledge that was embodied in the 2008 Constitution.[720] While significant in itself, the constitutional guarantees related to traditional knowledge drew attention to the lack of a formal, national framework to substantiate the form of protection that this knowledge should receive. Thus, the political momentum that indigenous and *campesino* organisations had gained during the Constituent Assembly process was further channelled into official efforts to develop an independent regime for traditional knowledge governance.

The mechanism through which the *Ingenios* Act grants protection for traditional knowledge builds upon guarantees recognised in the 2008 Constitution, by developing a *sui generis* system of rights. The *Ingenios* traditional knowledge framework is notable both for its comprehensive nature and for how the law devotes nearly equal space to traditional knowledge protection and to other chapters that cover conventional forms of intellectual property, such as patents or trademarks. Furthermore, it is significant that the *Ingenios* system for traditional knowledge

[719] Ecuador Ley de Propiedad Intelectual (Codificación Nº 2006-013), Art. 377.
[720] Constitución de la República del Ecuador de 2008, Art. 57.

protection is not cast in explicitly proprietary terms. As will be discussed in greater detail below, such a conceptualisation could be problematic for both theoretical and pragmatic reasons.

Under the *Ingenios* regime, traditional knowledge is defined broadly, to include

> "[A]ll knowledge, principally collective, such as practices, methods, experiences, capacities, signs and symbols belonging to peoples, nationalities and communities that form part of their cultural acquis and have been developed, actualised and transmitted from generation to generation. Traditional knowledge is, among others, ancestral and local knowledge, the intangible component associated with genetic resources and traditional cultural expressions."[721]

The *Ingenios* Act further enumerates several categories of processes and products that qualify as embodiments of traditional knowledge, while remaining open to recognising forms of knowledge that are not expressly listed. Examples include health related knowledge; agricultural practices; knowledge about the management of biodiversity; knowledge related to ecosystem function and conservation for climate change mitigation and adaptation; crafts and artistic creations and rituals; scientific technologies and innovations; music; sports and recreation; and architecture.[722] Thus, the *Ingenios* rendition of traditional knowledge covers an expansive range of subject matter, which if cast in standard intellectual property terms would fall under the ambit of patents (e.g., scientific technologies and innovations), copyright (e.g., artistic creations), geographical indications (e.g., crafts) or other regimes.

Under the framework that the *Ingenios* Act conceives, rights over traditional knowledge are collective, and they pertain to "legitimate possessors," not to owners.[723] In remaining faithful to the constitutional objective of plurinationality, the protection of traditional knowledge should be effectuated "in accordance with [legitimate possessors'] own customs, institutions and cultural practices, contributing to the strengthening of their traditional internal structures."[724] Given that rights in traditional knowledge are imagined as inherently collective, and because protection should be granted in accordance with the customs, institutions, and practices of the communities

[721] *Ingenios* Act, Art. 511.
[722] *Id.,* Art. 521.
[723] *Id.*, Art. 513.
[724] *Id.*

to which intellectual resources belong, the *Ingenios* Act speaks of possession rather than ownership of traditional knowledge. This formulation is supposed to conform to Indigenous Andean understandings of the relationship between individuals and their intellectual productions.[725]

While the attempt of the law to take local Ecuadorian cosmologies seriously is in itself significant, the *Ingenios* system for traditional knowledge protection is also noteworthy for its comprehensive nature. The regime does not operate solely as a defensive mechanism that would provide an instrument to challenge the novelty of applications for conventional forms of intellectual property, such as via a national registry or database. Instead, collective rights over traditional knowledge are recognised as "imprescriptible, inalienable, and inviolable."[726] Decision-making surrounding uses of protected subject matter is enshrined as a right of free determination, to be realised according to legitimate possessors' "own forms of conviviality, social organisation, institutions, and the generation and exercise of authority."[727]

Thus, the *Ingenios* Act aspires to provide a form of positive protection for traditional knowledge, the parameters of which should be consonant with local indigenous customary law. However, some officials at the National Service for Intellectual Rights believe that as currently drafted, the *Ingenios* system of protection for traditional knowledge is not sufficiently robust. Administrators have proposed modifications to the *Ingenios* Act, for instance to impose stricter sanctions for violations of the rights of legitimate possessors of traditional knowledge.[728] In fact, in October 2018 the motivation to bolster the *Ingenios* system was so strong that one official told me that he believed that the Act could be reformed before the end of the year.[729]

In the meantime, a draft set Technical Regulations, the final version of which will implement the *Ingenios* system of traditional knowledge protection, were published in July 2018.[730] The Technical Regulations specify that parties who wish to access,

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[725] Larrea, A. M. (2011). El Buen Vivir como Contrahegemonía en la Constitución Ecuatoriana. *Utopía y Praxis Latinoamericana, 53*, 59-70: 68.
[726] *Ingenios* Act*,* Art. 512.
[727] *Id*., Art. 520.
[728] Official at the National Service for Intellectual Rights of Ecuador. (25 October 2018). Personal interview.
[729] *Id*.
[730] Servicio Nacional de Derechos Intelectuales del Ecuador. "Borrador de Reglamento por Temas." *Retrieved from* http://www.paiecuador.ec/aporte_normativa/index.php (accessed 22 August 2018).

use, or utilise Ecuadorian traditional knowledge must conduct "due diligence" to locate the legitimate possessors.[731] This process should involve the steps of research and verification, to ensure that the correct persons are identified. Upon being contacted by a party seeking access to traditional knowledge, legitimate possessors would be empowered to: (1) authorise, stop, or deny access, use, or utilisation; (2) accept or reject the due diligence conducted by the party interested in obtaining the knowledge; (3) define, according to their customs, traditions, forms of living, and social organisation, the mechanisms of participation, representation, and traditional manners of decision making; (4) secure co-management in the case of shared traditional knowledge; and (5) negotiate the sharing of benefits with the party interested in obtaining the knowledge.[732] The proposed Technical Regulations also enumerate procedures that prospective users should follow to obtain prior informed consent from legitimate possessors; to distribute monetary and non-monetary benefits; and to execute contracts with legitimate possessors surrounding the use of traditional knowledge.

In contrast to the systems for traditional knowledge protection that certain other countries have enacted, under the *Ingenios* Act "the recognition of the collective rights of legitimate possessors over their traditional knowledge is not subject to any formality or registration for the effects of guaranteeing the protection, vigilance and exercise thereof, given that this power resides in the legitimacy of the communitarian sphere."[733] The proposed Technical Regulations substantiate this provision by recognising parallel systems of protection for traditional knowledge, which are comprised of a state-run database, deposit, and registry on the one hand, and on the other community registries to be administered according to customary law.[734] The Technical Regulations further stipulate that community registries should be managed based on locally developed procedures for the registration of traditional knowledge, according to customary norms and in the native language of the community.

Although as of 2018 the Technical Regulations to the *Ingenios* Act had not yet been finalised, the National Service for Intellectual Rights had already begun to

[731] Borrador, Reglamento de los Conocimientos Tradicionales. Capítulo XX.- De la debida diligencia al acceso a los conocimientos tradicionales.
[732] *Id*. Artículo XX.- De las atribuciones de los legítimos poseedores.
[733] *Ingenios* Act, Art. 522.
[734] Borrador, Reglamento de los Conocimientos Tradicionales. Capítulo XX.- Formas de protección de los conocimientos tradicionales.

inscribe examples of Ecuadorian traditional knowledge in its institutional registry. According to one official, as of October 2018 approximately 120 registrations had been made.[735] Furthermore, the National Service for Intellectual Rights was continuing to organise *in situ* sensibilisation events to explain the purpose of the traditional knowledge protection system to various communities in the Ecuadorian coastal, Sierra, and Amazon regions.[736]

Notably, early examples of the registration of traditional knowledge have resulted from direct collaboration with certain indigenous groups. Thus, administrators from the National Service for Intellectual Rights have travelled to local villages, where drafts of the traditional knowledge registration form were co-constructed with community members, especially those from the Tsáchila nationality.[737] One staff member at the National Service for Intellectual Rights told me that the participatory process through which the registration form has been designed has required officials to engage in "day to day learning, which is quite dynamic."[738]

Another interesting aspect of the *Ingenios* system for the protection of traditional knowledge is that the law recognises the coexistence of private intellectual property on the one hand, and the "public interest character of knowledge" on the other. In so doing, the *Ingenios* Act explicitly delimits the relationship between traditional knowledge and the public domain. This demarcation serves to challenge the "romance of the commons" in which the "information resources of the West" were propertised while the "information resources of the rest of the world, such as genetic resources and traditional knowledge" were left in a global commons.[739] According to the delineation that the *Ingenios* Act establishes, traditional knowledge is only considered to be in the public domain when this knowledge has left the "cultural ambit" of its legitimate possessors, and is found in bibliographic resources, databases, or *ex situ* collections.[740]

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[735] Director level official at the National Service for Intellectual Rights of Ecuador. (19 October 2018). Personal interview.
[736] *Id*.
[737] Official at the National Service for Intellectual Rights of Ecuador. (25 October 2018). Personal interview.
[738] *Id*.
[739] Chander, A. & Sunder, M. (2004). The Romance of the Public Domain. *California Law Review, 92*, 1331-1374: 1331.
[740] *Ingenios* Act, Art. 526.

In the event that traditional knowledge has passed into the public domain, under the *Ingenios* system the government would nonetheless recognise the rights of legitimate possessors to "a just and equitable participation in the benefits" derived from any exploitation of such knowledge.[741] By recognising these collective rights, the *Ingenios* Act further intends to challenge the standard dichotomy between public domain and private rights, which frequently characterises debates about intellectual property. As one means to accomplish this end, the *Ingenios* Act deliberately pluralises the word knowledge ("*conocimientos*") in order to recognise the inherent value in forms of knowledge not conventionally acknowledged in conventional intellectual property regimes. As Chapter 3 of the thesis already discussed, it was not a "mere coincidence [to include] the noun knowledges – in plural – in the name of the [*Ingenios* Act]."[742]

The rhetorical respect that the *Ingenios* Act has for traditional knowledge is reinforced by the numerous privileges that the law grants to legitimate possessors. These include the right to maintain, foster, manage, enrich, protect, control, innovate, and develop traditional knowledge, as well as the right to impede or halt the improper access, use, and utilisation of this knowledge by third parties.[743] The Act also recognises legitimate possessors' right of free determination over decisions related to their traditional knowledge,[744] and guarantees that the same protections will be afforded to legitimate possessors whose original geographical territories extend to land outside of the modern borders of Ecuador, and who therefore may not actually be Ecuadorian citizens.[745]

The system of traditional knowledge protection that the *Ingenios* Act institutes aspires to empower communities to manage their knowledge on their own terms. This intention of the law has inspired passion in the way that representatives of the National Service for Intellectual Rights approach their work. For instance, as one official confided to me, "I am always attentive, careful [to ensure] that this knowledge is not lost. Sometimes I can't sleep. I wake up and ask myself, what would happen if this information disappeared?"[746] Although both the *Ingenios* Act and the actors who are

[741] *Id*.
[742] *Código Ingenios*, Exposición de Motivos, Versión entregada a la Asamblea Nacional, 2 de junio de 2015.
[743] *Ingenios* Act, Art. 526.
[744] *Id.,* Art. 520.
[745] *Id.,* Art. 518.
[746] Official with the National Service for Intellectual Rights of Ecuador. (25 October 2018). Personal interview.

responsible for the implementation of the law intend to empower Ecuadorian indigenous communities to govern their intellectual resources on their own terms, in order to be effective the Act requires traditional knowledge to be formally inscribed and administered by the State.

Thus, the regime situates the National Service for Intellectual Rights as the central archivist, intermediary, and enforcer of Ecuadorian traditional knowledge. While legitimate possessors are under no formal obligation to register their knowledge – the system runs on "voluntary deposits" – the hope is that the greatest amount of information possible will be placed in the centralised registry. Officials have spent countless hours on-site, working with communities to explain the importance of traditional knowledge deposits. One administrator who has been involved in such initiatives since 2009 – long before the *Ingenios* Act was even conceived – described the experience as "a constant battle for the community to understand why this is important. That they can trust me."[747]

These efforts may well pay off. Another official described the sensibilisation process as contagious, such that once the National Service for Intellectual Rights has travelled to one community, others "write to us or call us or come to our offices and tell us 'we want this too.' And this creates a domino effect, and we keep working and working."[748] However, even if this momentum were to manifest in the establishment of nationwide community-based registries, traditional knowledge would need to be made legible in new ways to the centralised Ecuadorian governmental apparatus. For instance, according to the system proposed in the draft Technical Regulations, local custodians would be obligated to submit an annual report to the National Service for Intellectual Rights that would detail the number of registrations made and the security measures employed to protect the knowledge that has been deposited.[749] Furthermore, the National Service for Intellectual Rights would constitute the entity responsible for undertaking "permanent monitoring of the collective rights of legitimate

[747] *Id*.
[748] Director level official at the National Service for Intellectual Rights of Ecuador. (18 October 2018). Personal interview.
[749] Borrador, Reglamento de los Conocimientos Tradicionales. Artículo XX.- De los informes del custodio local.

possessors," for the stated purpose of preventing improper access, use, or utilisation of traditional knowledge.[750]

Notwithstanding the trend towards centralisation, the system for the protection of traditional knowledge imagined in the *Ingenios* Act contains many provisions that are designed to empower marginalised peoples and their ways of knowing the world. However, another potential issue is the fact that transforming "culturalized communities" into subjects of neoliberal government could entail unintended consequences. For instance, Coombe has argued that, concomitant with the extension of a rights-based framework to protect traditional knowledge, indigenous communities are configured in increasingly politicised economic terms as holders of collective property that they are "encouraged to culturalize."[751] This has occurred in Ecuador in part through the institutionalisation of traditional knowledge protection in the *Ingenios* Act. Even if not expressly conceptualised as intellectual property, the doctrinal linkage of rights related to traditional knowledge with the copyright, patent, and trademark regimes may have the effect of translating indigenous ways of knowing the world into the rationality of neoliberalism.

According to such an interpretation, the *Ingenios* Act operates as a new governmental technology through which indigenous and other subaltern groups are encouraged to represent themselves as "collective subjects bearing distinctive cultures and safeguarding valuable diversity."[752] In this context, the protection of traditional knowledge may extend novel opportunities to historically marginalised peoples – for instance through greater political visibility, participation in decision-making, or access to new economic resources. However, doing so could also serve to make these groups legible to different actors, while also reifying "social imaginaries" that presume the existence of unified communities that receive uniform benefits from the exploitation of their cultural goods.[753] Evidence for this possibility may be found in

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[750] *Id*. at Art. XX.- Del monitoreo sobre casos de acceso, uso o aprovechamiento indebido de conocimientos tradicionales.
[751] Coombe, R. J. (2016). The Knowledge Economy and its Cultures. Neoliberal Technologies and Latin American Reterritorializations. *HAU: Journal of Ethnographic Theory, 6*(3), 247-275, 248.
[752] *Id*. at 266.
[753] *See* Coombe, R. J. & Malik, S. A. (2017). Rethinking the Work of Geographical Indications in Asia: Addressing Hidden Geographies of Gendered Labor. In I. Calboli & W. Ng-Loy (Eds.), *Geographical Indications at the Crossroads of Trade, Development, and Culture: Focus on Asia-Pacific* (pp. 87-121, 89). Cambridge, UK: Cambridge University Press. Although this chapter discusses the particular social imaginaries that are reinforced by geographical indications and other marks indicating conditions of origin, the essential argument may also be applied to the protection of traditional knowledge in Ecuador.

the refinements that officials from the National Service for Intellectual Rights continue to make to the registration form, to obtain information such as geographic coordinates, and age and gender of the legitimate possessor. As one administrator explained to me, these details are important to ensure that the government may quantify the traditional knowledge contained within the national territory, and understand trends related to the deposits made.[754]

At a broader level, the idea that the protection of traditional knowledge may function as a means to actualise the contemporary Ecuadorian strategy for national development is conceptually problematic. It has been noted that the notion of "sustainable development is an oxymoron."[755] In contrast, as Kothari *et al.* note, "in indigenous knowledge, there is nothing analogous to the concept of development.… There is no concept of a linear process of life to establish a *before* and *after* state, namely underdevelopment and development."[756] Correspondingly, the recognition of traditional knowledge in a regime designed primarily for the protection of intellectual property could precipitate effects that further entrench the neoliberal political and economic structures that the *Ingenios* Act purports to disrupt.

In practice, it is conceivable that the *Ingenios* Act will enable legitimate possessors of traditional knowledge to prevent certain forms of exploitation. However, the law may also operate to incentivise the holders of traditional knowledge to monetise manifestations of their cultures. Furthermore, although the *Ingenios* Act explicitly recognises that traditional knowledge is not static, the establishment a system through which this subject matter may be protected requires that traditional knowledge be rendered legible in a particular way so that it can be administered by centralised systems of governance. Thus, traditional knowledge must be fixed and translated into terms that in certain ways conform to a possessive – if not necessarily proprietary – logic.

Notwithstanding these criticisms, the system of traditional knowledge protection established in the *Ingenios* Act could still represent an interesting example for countries to consider when they explore alternatives to conventional forms of

[754] Official with the National Service for Intellectual Rights of Ecuador. (25 October 2018). Personal interview.
[755] Kothari, A., Demaria, F., & Acosta, A. (2014). Buen Vivir, Degrowth and Ecological Swaraj: Alternatives to Sustainable Development and the Green Economy. *Development, 57*(3-4), 362-375: 362.
[756] *Id*. at 367.

intellectual property for plants. Although the traditional knowledge chapter of the *Ingenios* Act does not establish a model of intellectual property for plants that would operate as an alternative to plant breeders' rights, the law does offer a mechanism through which farmers' and indigenous peoples' knowledge about how to use certain kinds of plants may be protected from misappropriation. Thus, one effect of the *Ingenios* system could be that users of native and local Ecuadorian flora would be required to obtain authorisation from the legitimate possessors of traditional knowledge about a particular plant, where such knowledge is implicated in its use. This arrangement suggests that the users would be expected to provide some form of compensation to the legitimate possessors for the use of their knowledge.

Furthermore, the traditional knowledge registries that the *Ingenios* Act institutes could serve as a mechanism to prevent the monopolisation of particular plants by other parties through the use of other forms of intellectual property. This could occur where registered traditional knowledge is used to defeat claims of novelty in applications for patents or plant breeders' rights, which is, according to policymakers, one of the key objectives of the law.[757] Given these possibilities, regimes that grant protection for traditional knowledge – like the system established by the *Ingenios* Act – could be understood as one piece in a mosaic of legislative options that both legally unbound and legally bound countries might consider as means to regulate plants as intellectual property. These various options will be explored in greater detail in Chapter 5 of the thesis, in the form of lessons learned from the Ecuadorian experiment.

[757] Official with the National Service for Intellectual Rights of Ecuador. (25 October 2018). Personal interview.

Chapter 5. Lessons from the Ecuadorian Approach to Intellectual Property for Plants

In response to the observation that the plant breeders' rights model has proliferated worldwide, influencing the way that people think about how to structure relationships between people, institutions, and plants, the final section of Chapter 2 of the thesis proposed two standardised options for lawmaking. It should be noted that the adoption of these strategies would presuppose a coordinated effort on the part of national governments. In reality, lawmakers in many countries not understand the various issues that are implicated in regimes that regulate the uses of different types of plants, or how these concerns interrelate with one another. Furthermore, many governments experience partisan intransigence, rendering it difficult for actors from across the political spectrum to cooperate. Yet another obstacle is that many territories have already enacted legislation to address some but not all of the issues discussed throughout this thesis, and therefore substantive reform of existing laws may be improbable. For these reasons, it is important that lawmakers consider governing the relationships between people, institutions, and plants through multiple legal frameworks.

To explore how this option might operate in practice, it will be informative to remain grounded in the case study of Ecuador, which Chapters 3 and 4 of the thesis have described in detail. The Ecuadorian case is noteworthy for several reasons. First, it involves a country that was effectively controlled by a single party for approximately one decade under the administration of President Rafael Correa and his Citizens' Revolution government (2007-2017). Under the Correa presidency, a new Ecuadorian Constitution was enacted in 2008, and numerous other law reform efforts were undertaken subsequently. This momentum for change meant that several regimes related to the governance of interactions between people, institutions, and plants were remade, in some ways according to rationalities associated with concepts including "*buen vivir*" and "twenty-first century socialism," as well as the Citizens' Revolution strategy for national development. Thus, while the various issues that underlie the regulation of different types of plants were not contemplated in a singular framework, these matters were all legislated based on the priorities of the same dominant political ideology.

During the tenure of the Citizens' Revolution government under President Correa, several laws that govern the uses of different kinds of plants were remade. These include the framework that grants intellectual property in the form of plant breeders' rights, as well as the system for the protection of traditional knowledge, which are both embodied in the 2016 *Ingenios* Act. Another pertinent regime is the 2017 Law for Agrobiodiversity, Seeds, and the Promotion of Sustainable Agriculture ("2017 Seed Law"), which re-structures the national seed system and the relationships between the various actors that interrelate in this space. A third framework is the 2009 Food Sovereignty Law, which enacts a system designed to promote local agricultural production as a means to ensure sustainable access to nutritious and culturally-appropriate food. Finally, the National Regulations to the Common Regime on Access to Genetic Resources in the Andean Community[758] were implemented in Ecuador in 2011. This regime governs how Ecuadorian plant genetic resources may be accessed, in addition to establishing the basic terms for how providers and users of these resources should interact.

Chapters 3 and 4 of the thesis have already described how the various, recently enacted Ecuadorian laws operate to uphold the country's international obligations while simultaneously addressing other important national policy goals related to structuring the relationships between people, institutions, and plants. The treaty frameworks whose provisions are relevant to this discussion are the TRIPS Agreement, the 1978 version of the UPOV Convention, the norms of the Andean Community, the Convention on Biological Diversity, the Plant Treaty, and the Nagoya Protocol. Ecuador is party to all of these international instruments and thus the country is legally bound to uphold numerous commitments related to the regulation of the access and use of plants, including according to a proprietary logic.

The nature of Ecuador's international obligations can be distilled into four key elements: (1) the regulation of plants as intellectual property, via a system that recognises plant breeders' rights; (2) the protection of customary agricultural practices; (3) the protection of traditional knowledge related to plants, including those which are used for agricultural purposes; and (4) the regulation of access to plant genetic resources and equitable sharing of benefits derived from the commercial exploitation

[758] These regulations are embodied in Decreto No. 905, El Reglamento Nacional al Régimen Común sobre Acceso a los Recursos Genéticos en Aplicación a la Decisión 391 de la Comunidad Andina (3 de octubre de 2011).

of these resources. The first element, namely the embodiment of plants in an intellectual property law, was already analysed at length in Part 1 of the thesis, and therefore the discussion will not be repeated here. Instead, the following sections will review how Ecuadorian lawmakers have incorporated the remaining three elements into a variety of recent legislative and regulatory initiatives.

5.1. Protections for Customary Agricultural Practices

Protections for customary agricultural practices have been significantly expanded under Ecuadorian law in recent years. As described in Chapter 4 of the thesis, the reformed intellectual property regime for plants that the 2016 *Ingenios* Act adopted includes provisions that expand the exceptions to the exclusive rights of plant breeders beyond those which were recognised in the 1998 Intellectual Property Law. Specifically, the *Ingenios* Act limits the proprietary rights of plant breeders such that authorisation is not required to use protected plant varieties for private, non-commercial purposes. The Act also permits the use of intellectual property protected plant varieties "in the context of ancestral agricultural practices or in a traditional communitarian ambit," which is defined to include the non-profit sale or exchange of seeds or other material derived from protected varieties.[759] Furthermore, the *Ingenios* Act stipulates that farmers may use plant varieties protected with plant breeders' rights for the purposes of multiplication or exchange with other farmers, provided that the breeder's trademark or commercial name is not used.[760]

The 2017 Seed Law is another recently enacted Ecuadorian legal instrument that provides safeguards for systems of customary seed management. This legislation "guarantees the free use, production, promotion, conservation and exchange" of the seed of "native" and "traditional" plant varieties.[761] The new law also pledges to ensure that native and traditional, as well as "certified" seed is able to be freely produced, conserved, commercialised, exchanged, and accessed by farmers.[762] This guarantee is reinforced in another clause, which specifies that farmers may "conserve on their holdings, utilise, exchange, and commercialise their planting or propagating

[759] *Ingenios* Act, Art. 489(3).
[760] *Id*. at Art. 491.
[761] 2017 Seed Law, Art. 1.
[762] *Id*. at Art. 8(b).

material."[763] Finally, the 2017 Seed Law obligates the Ecuadorian State to sustainably "preserve, produce, regenerate, conserve, revitalise, distribute, promote, and facilitate the use, free exchange, and consumption" of native and traditional seed.[764] In the future, officials hope that this provision will be realised through concrete programs, for instance initiatives to establish community seed banks or to organise local seed fairs.[765]

Ecuadorian customary agricultural practices are also protected in the country's 2009 Food Sovereignty Law. This legislation provides the broad guarantee that the State as well as individual citizens and collectives "shall promote and protect the use, conservation, qualification, and free exchange of all native seed."[766] This language is further complemented by the provision that "native germplasm, seeds, plants and ancestral knowledge associated therewith constitute the heritage of the Ecuadorian people, [and] consequently they shall not be subject to appropriation in the form of patents or other intellectual property modalities."[767] The prohibition on the granting of proprietary rights over Ecuadorian biodiversity and traditional knowledge is grounded in the 2008 Constitution,[768] and it is reified in other legislative regimes including the 2017 Seed Law.[769] This and other legislative provisions are designed to guarantee that seeds and other vegetal planting material may be broadly accessed and utilised.

Furthermore, some aspects of the recent lawmaking experiments in Ecuador appear to be designed to extend intellectual property protection for new varieties of plants that are produced through customary practices. For instance, the 2017 General Regulations to the *Ingenios* Act stipulate that for the evaluation of applications for plant breeders' rights protection, for plant "varieties obtained through the empirical method based on experimentation and observation that farmers realise, the same requirements as for varieties obtained through classical or modern plant biotechnological methods shall not be applied."[770] Thus, in contrast to countries such

[763] *Id*. at Art. 9(b).
[764] *Id*. at Art. 14(b).
[765] Director level official at the National Institute for Agricultural Research of Ecuador. (2 November 2018). Personal interview.
[766] Ley Orgánica del Régimen de la Soberanía Alimentaria. (5 de mayo de 2009). Registro Oficial Suplemento 583. Art. 8.
[767] *Id*.
[768] *See* Constitución de la República del Ecuador de 2008, Art. 402.
[769] *See* 2017 Seed Law, Los Considerandos, ¶ 12.
[770] Reglamento General al Código Orgánico de la Economía Social de los Conocimientos, Creatividad e Innovación. Decreto Presidencial No. 1435. (23 de mayo de 2017) pg. 14 (emphasis added).

as India, Malaysia, and Thailand, Ecuador has not created a separate category of protection for farmers' varieties in its intellectual property law for plants. Instead, the country has created a legal basis for the differentiation between farmers' and professional breeders' plant varieties at the level of regulation.

As of 2018, the Technical Regulations that will implement the *Ingenios* Act remained in draft form, and as such it was difficult to determine how farmers' plant varieties will ultimately be treated by Ecuadorian administrative agencies. The draft Technical Regulations that were published in July 2018 did not formally create separate criteria for the evaluation of farmers' versus breeders' plant varieties, though it remained possible that different ranges of distinctness, uniformity, and stability could be established for each category. Alternatively, the Technical Regulations could simply reify the language from the General Regulations, and thereby grant a measure of latitude to examiners for plant breeders' rights to determine eligibility for protection. This facet of the Ecuadorian case study may merit consideration by other countries, given that it highlights the need for lawmakers to look beyond the legislative to the administrative realm when designing systems of intellectual property for plants.

5.2. Protection of Traditional Knowledge Related to Plants

The system for the protection of Ecuadorian traditional knowledge has been built around new guarantees that were established in the country's 2008 Constitution. The new constitutional framework recognises the right of indigenous and local peoples, communities, and nationalities to maintain, protect, and develop their ancestral knowledge, science, and technologies, and specifically their traditional knowledge related to national genetic resources.[771] The 2008 Constitution also prohibits all forms of misappropriation of collective knowledge, as well as of genetic resources related to Ecuadorian agrobiodiversity.[772] Finally, the new constitutional framework creates a national system for science, technology, innovation, and traditional knowledge. One of the purposes of this platform is to recover, strengthen, and enhance ancestral knowledge in Ecuador.[773]

[771] Constitución de la República del Ecuador de 2008, Art. 57(12).
[772] *Id*. at Art. 322. *See also id.* at Art. 402 (prohibiting the granting of intellectual property rights over derived or synthesized products obtained through the collective knowledge associated with national biodiversity).
[773] *Id*. at Art. 385.

As a means to implement the new constitutional guarantees, the 2016 *Ingenios* Act elaborated an extensive chapter on traditional knowledge protection, which was analysed in Chapter 4 of the thesis. It is worth reiterating here that the new framework for traditional knowledge rights in Ecuador is comprehensive, offering a positive form of protection that includes voluntary government-administered and community-based registries, in addition to defences against the unauthorised access, use, and utilisation of traditional knowledge. The subject matter that this law covers is broad, including for instance knowledge about natural products and compositions for uses related to agriculture, fishing, hunting, and other subsistence activities.[774] Protection is also available for knowledge about practices related to the sowing and harvesting of plants, seed management and collection, and other agricultural activities,[775] and knowledge about natural biological compounds used for the elaboration of foodstuffs.[776]

There are several reasons why the traditional knowledge chapter of the *Ingenios* Act represents an interesting example that could inspire similar legislation in other countries. For instance, the law acknowledges that a substantial amount of locally-held agricultural knowledge may have been divulged in an oral or informal manner to people from outside of the community during the collection of local plant genetic resources. In many cases, such information now accompanies the collected physical material in *ex situ* germplasm collections, and it is considered to be in the public domain.

In recognition of this trend, the *Ingenios* Act guarantees the right of the legitimate possessors of knowledge associated with plant genetic resources that have been collected and stored in *ex situ* collections to "just and equitable" benefit sharing, even where no prior informed consent has been obtained and where no agreement was executed between the providers and users of the resources.[777] The language of this provision suggests that it is intended to apply to samples that were collected prior to the entry into force of the Convention on Biological Diversity, or the subsequent establishment of the Andean Community and the Ecuadorian regional and national regimes for access and benefit sharing. It is unclear how such a measure would be enforced, though it is a remarkable example of the extent to which the *Ingenios* Act

[774] *Ingenios* Act, Art. 521(d).
[775] *Id*. at Art. 521(e).
[776] *Id*. at Art. 521(c).
[777] *Id*. at Art. 526.

attempts to substantively implement the spirit of the Convention on Biological Diversity, the Plant Treaty, and the Nagoya Protocol.

The 2017 Seed Law also endeavours to actualise the guarantees established in Ecuador's 2008 Constitution, by recognising a form of protection for traditional knowledge held by farmers, complementing the broader framework created in the that the *Ingenios* Act creates. The 2017 Seed Law grants a "right of communes, communities, peoples, and nationalities to the recognition and valorisation of ancestral and traditional knowledge linked to agrobiodiversity and the production of seeds, as well as the substantial role of women and the elderly in the conservation, protection, and safeguarding thereof."[778] The 2017 Seed Law further guarantees the ability of farmers to participate, both as individuals and collectively, in the protection of traditional knowledge related to the use of agrobiodiversity.[779]

The 2017 Seed Law is also concerned with the recovery and promotion of ancestral knowledge, and of agroecological and organic practices and technologies, formulating this priority as an express obligation that the State is bound to uphold.[780] The law reinscribes the government's constitutional duty to prohibit all forms of misappropriation of individual and collective traditional knowledge,[781] and to adopt measures to prevent the loss of traditional knowledge and customary practices associated with agrobiodiversity, native seeds, and food.[782] The 2017 Seed Law also requires the State to establish mechanisms to promote, regenerate, conserve, care for, improve, and multiply – both *in situ* and *ex situ* – native seeds and associated knowledge.[783] Finally, the legislation states that the Ecuadorian government is responsible for prohibiting the granting of patents or other forms of intellectual property claiming derived or synthesized products that have been obtained through the use of collective knowledge associated with national agrobiodiversity.[784]

An additional provision that the 2017 Seed Law enacts in relation to traditional knowledge is the express recognition of the "dialogue of knowledges," a concept that was discussed in Chapters 3 and 4 of the thesis. In the 2017 Seed Law, the dialogue

[778] 2017 Seed Law, Art. 8(d).
[779] *Id*. at Art. 10(d).
[780] *Id*. at Art. 14(b).
[781] *Id*. at Art. 14(c).
[782] *Id*. at Art. 14(e).
[783] *Id*. at Art. 14(p).
[784] *Id*. at Art. 14(r).

of knowledges is invoked as a means to structure the relationship between scientific inquiry and traditional knowledge. Specifically, the legislation provides that future research programs developed in Ecuador should "respect ancestral knowledge in matters of agrobiodiversity, seeds, and sustainable agriculture."[785] When read against the backdrop of the text as a whole, it appears that the 2017 Seed Law intends to formally elevate the status of traditional knowledge in Ecuador, such that it would interact with and inform professional scientific agricultural knowledge. Thus, rather than conceptualise traditional knowledge as static or archaic, the framework regards Indigenous Ecuadorian ways of knowing as coequal with other forms of agricultural knowledge.

A fourth legal instrument that was recently enacted in Ecuador and which incorporates provisions related to traditional knowledge is the national regulatory framework for access to genetic resources and equitable benefit sharing. As in other laws already discussed in this section of the thesis, these National Regulations to the Common Regime on Access to Genetic Resources in the Andean Community expressly prohibit the Ecuadorian State from recognising private rights – including in the form of intellectual property – over derived or synthesized products obtained using the collective knowledge associated with national biodiversity.[786] This framework further designates the National Environmental Authority as the entity responsible for regulating access and benefit sharing in Ecuador, mandating that this Authority coordinate all actions related to prevention, control, and sanctions to combat illegal and illegitimate access to genetic resources and associated traditional knowledge.[787] Likewise, the regulations appoint the Secretariat of Peoples, Social Movements, and Citizen Participation as the agency responsible for coordinating prior informed consent with local communities to obtain access to traditional knowledge associated with Ecuadorian genetic resources.[788]

The 2009 Food Sovereignty Law is a final example in the web of recently enacted laws that are designed to protect traditional knowledge in Ecuador. According to this framework, the national food sovereignty "regime" is intended to promote practices towards the realisation of sustainable and nutritious, local-level food

[785] *Id*. at Art. 23.
[786] Decreto No. 905, El Reglamento Nacional al Régimen Común sobre Acceso a los Recursos Genéticos en Aplicación a la Decisión 391 de la Comunidad Andina (3 de octubre de 2011), Art. 4.
[787] *Id*. at Art. 8.
[788] *Id*. at Art. 11.

production, "respecting and protecting agrobiodiversity, traditional and ancestral knowledge and forms of production, under the principles of equity, solidarity, inclusion, [and] social and environmental sustainability."[789] Thus, in contrast to conventional approaches to food security that groups such as the Food and Agriculture Organization of the United Nations endorse,[790] Ecuador has adopted a national policy that focuses on self-reliance in food production and consumption. Traditional knowledge is taken seriously within this paradigm, since one of the essential aims of the law is to base the national food system on local, small-scale agricultural production.[791]

Indeed, the 2009 Food Sovereignty Law stipulates that the national government must protect the right of Ecuadorian rural communities, peoples, and nationalities to conserve and promote their biodiversity management practices, as well as to develop their collective knowledge, science, technologies, and ancestral wisdom.[792] As with the other Ecuadorian laws analysed above, the food sovereignty legislation guarantees that "native germplasm, seeds, plants, and the ancestral knowledge associated therewith constitute the heritage of the Ecuadorian people, [and] consequently they shall not be subject to appropriation in the form of patents or other intellectual property modalities."[793] This provision complements the form of traditional knowledge protection that the *Ingenios* Act establishes. In other words, although holders of traditional knowledge are shielded from misappropriation by unauthorised third parties, they may themselves register their knowledge and receive a kind of collective intellectual right from the government.

[789] 2009 Food Sovereignty Law, Art. 1.
[790] The United Nations conceptualises food security as the availability and adequate access at all times to sufficient, safe, and nutritious food so that people are able to maintain healthy and active lives. United Nations World Food Programme. (2018). "What is food security?" *Retrieved from* https://www.wfp.org/node/359289. In contrast, food sovereignty is frequently characterised as a question of the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, in addition to peoples' right to define their own food and agriculture systems. Forum for Food Sovereignty, Declaration of Nyéléni (23-27 February 2007), Sélingué, Mali. *Retrieved from* https://nyeleni.org/spip.php?article290.
[791] 2009 Food Sovereignty Law, Art. 1.
[792] *Id*. at Art. 9.
[793] *Id*. at Art. 8.

5.3. Regulation of Access to Plant Genetic Resources and Equitable Benefit Sharing

The national framework for access to plant genetic resources and equitable benefit sharing in Ecuador is derived from legislation that was promulgated at the regional level by the Andean Community. The relevant norms were established in Decision 391 of the Andean Community, which was enacted in 1996, shortly after the entry into force of the Convention on Biological Diversity. Decision 391 reaffirmed the principle of national sovereignty over genetic resources and any products derived from these resources. Thus, the Andean Community regime acknowledged that its members were responsible for implementing independent, national level rules for access and benefit sharing. Despite this recognition, Decision 391 instituted the basic parameters to which such domestic systems must conform.

For instance, Andean Community Decision 391 delineated the basic protocols for the lodging of applications for access to genetic resources,[794] as well as the execution of access agreements between the relevant National Authority and the prospective user of the resources.[795] Under Decision 391, the access agreement must "take into account the rights and interests of providers."[796] Thus, in the event that an "intangible component" such as the traditional knowledge of local peoples is implicated, the agreement must include an annex with terms related to the just and equitable sharing of any benefits derived from the utilisation of the resource.[797] The resource providers themselves must sign this annex, and the transaction is subject to review by the relevant National Authority. Additionally, an "accessory agreement" must be executed between the prospective user of the resource and the owner of land from which it is sourced, if the resource in question is obtained on private property.[798]

The framework created in Decision 391 also included limitations on access for any plant genetic resources that are used in the context of customary agricultural practices. For instance, Andean Community Member States may partially or totally restrict access to certain genetic resources if "essential elements of peoples' cultural

[794] Decisión 391 de la Comunidad Andina. Régimen Común sobre Acceso a los Recursos Genéticos (2 de julio de 1996), Caracas, Venezuela. Art. 26.
[795] *Id*. at Art. 32.
[796] *Id*. at Art. 34.
[797] *Id*. at Art. 35.
[798] *Id*. at Art. 41(a).

identity" would be negatively impacted,[799] or if undesirable environmental effects[800] or genetic erosion[801] could occur. In the event that genetic resources were accessed absent the appropriate governmental authorisation, Decision 391 would permit signatories to impose a variety of sanctions, including administrative, civil, and criminal penalties.[802]

In Ecuador, Decision 391 has been substantiated and implemented through the National Regulations to the Common Regime on Access to Genetic Resources. In addition to fulfilling obligations to the Andean Community and the Convention on Biological Diversity, these National Regulations were expressly designed as a means for the country to comply with the access and benefit sharing protections that the Plant Treaty establishes for farmers in particular.[803] The provisions of these various international instruments are unified and reified in the National Regulations. Furthermore, the Ecuadorian system expands on the minimum standards that the treaties originally instituted.

For instance, under the Ecuadorian National Regulations, all agreements that are negotiated for access and benefit sharing must specify an appropriate mechanism for the distribution of benefits resulting from the utilisation of genetic resources or derivatives thereof.[804] A system of monitoring and evaluation must also be detailed in the access agreement, and the payment of economic benefits – either actual or potential – derived from the worldwide commercialisation of any products generated based on the accessed resource must be guaranteed.[805] Non-monetary benefits must also be included as an essential condition for the approval of the access agreement, for example via the transfer of any technologies that have been developed through the use of the resource.[806] When local communities are involved as providers of an "intangible component" associated with the relevant genetic resource, accession to

[799] *Id*. at Art. 45(c).
[800] *Id*. at Art. 45(d).
[801] *Id*. at Art. 45(e).
[802] *Id*. at Art. 47.
[803] Decreto No. 905, El Reglamento Nacional al Régimen Común sobre Acceso a los Recursos Genéticos en Aplicación a la Decisión 391 de la Comunidad Andina (3 de octubre de 2011), Los Considerandos, ¶12.
[804] *Id*. at Art. 26.
[805] *Id*.
[806] *Id*.

the terms of the access agreement must occur locally, in the communities themselves.[807]

Consistent with the terms of Decision 391, the Ecuadorian National Regulations further elaborate provisions for access to "intangible components" that are associated with genetic resources. This subject matter is defined as all collective or individual knowledge, innovations, or practices, with real or potential value, associated with genetic resources and the derivatives thereof.[808] The section of the National Regulations designed to enable access to intangible components specifies that an annex to the access agreement that contains terms for access and benefit sharing must be reviewed and signed by the legal representative of the local community from which the knowledge or information associated with the genetic resource has been obtained.[809] The National Environmental Authority of Ecuador is required to review and sign this annex agreement to ensure compliance with the access and benefit sharing law.

In addition to the specialised framework elaborated in the National Regulations, access and benefit sharing is also covered in the traditional knowledge chapter of the *Ingenios* Act. The latter regime reinforces the parameters previously established in the National Regulations by providing more precise terms for how users can obtain free, prior, and informed consent from providers of traditional knowledge. For instance, the prospective user must divulge sufficient information to traditional knowledge holders about the purposes, risks, implications, and eventual uses and applications of the accessed knowledge.[810] Prospective users are also required to utilise culturally appropriate methods for obtaining consent, and to "respect the dialogue of knowledges."[811]

Under the *Ingenios* Act framework for access and benefit sharing, all determinations that legitimate possessors of traditional knowledge make to grant or deny access must be registered with the national intellectual property authority as a means to enforce the decisions.[812] The *Ingenios* Act further specifies that access agreements must be executed in Spanish as well as in the legitimate possessors'

[807] *Id*.
[808] *Id*. at Art. 6.
[809] *Id*. at Art. 34.
[810] *Ingenios* Act, Art. 530.
[811] *Id*.
[812] *Id*. at Art. 531.

native language, if it exists in written form.[813] Once signed, these agreements must be reviewed by the national intellectual property authority – with oversight by the National Secretariat for Higher Education, Science, Technology, and Innovation – to verify the existence of prior, free, and informed consent, and just and equitable benefit sharing.[814]

When read against the aforementioned National Regulations to Andean Community Decision 391, it becomes clear that multiple Ecuadorian governmental authorities are responsible for ensuring that the provisions surrounding access to genetic resources and equitable benefit sharing are effectively actualised. Although in theory such redundancy could be intended to provide strong protection for holders of traditional knowledge, in practice bureaucratic inefficiency or interagency conflict could operate to hinder effective relations between resource providers and users. For this reason, other countries seeking to follow the Ecuadorian example could consider appointing a single government authority as the overseer of the national access and benefit sharing regime.

* * *

Chapter 5 of the thesis has invoked the Ecuadorian case study as an example for how countries might implement multiple legal frameworks to structure relationships between people, institutions, and plants beyond the conventional template for plant breeders' rights. The Ecuadorian example demonstrates that countries do not necessarily need to cover all relevant issues in the same law. In fact, there are potential advantages to legislating intellectual property for plants in one regime and related issues in separate regimes, provided that the various frameworks are connected by a unified approach to governance. For instance, the strategy of enacting multiple laws could create diverse causes of action for violations, in addition to rendering issues related to the governance of plants and knowledge about how to use them as increasingly visible and available as a means for diverse social actors to influence public policy. Countries that wish to follow the Ecuador's example by implementing multiple laws to regulate the relationships between people, institutions, and plants could consider the following points:

[813] *Id*. at Art. 532.
[814] *Id*. at Art. 533.

- The various issues related to the regulation of different kinds of plants could be incorporated wholly or partially into diverse existing or reformed legal frameworks related to agriculture and rural livelihoods. Relevant laws could include those which cover intellectual property for plants, seed certification and control, biodiversity conservation, traditional knowledge protection, access and benefit sharing, food sovereignty, or others.
- Where the kind of rapid reinvention of multiple legal frameworks that occurred in Ecuador from 2007 to 2017 is not possible, a country might consider making modifications in administrative rather than legislative regimes. That is, even where comprehensive law reform is not feasible, it may be possible to rewrite a relatively narrower set of regulations.
- When adopting a strategy to structure relationships between people, institutions, and plants through a variety of separate legal instruments, governments should cultivate an awareness of the various external and internal factors that could limit the potential for innovative lawmaking. Furthermore, lawmakers should strive to understand how the various international obligations to which their country is subject intersect and overlap, and how these external factors intertwine with social, political, and economic factors that are internal to the country. Ideally, even while the various relevant issues may be addressed in separate laws, all pertinent regimes should be crafted according to a unified strategy for policy development.

Part 3. Conclusion

The story that this thesis has told exists in the context of conversations and debates over the relationship between intellectual property and plants, which have surfaced in diverse settings throughout the world over the past two decades or so. The expansion of the conceptual intersection between intellectual property and plants may be attributed to numerous converging factors. These include the changing nature of agriculture worldwide, which is driven by forces including the development of new technologies, climate change and its associated environmental impacts, and demographic trends including a significant increase in the human population.

At the same time, indigenous groups and their advocates have become increasingly organised and vocal about the need to protect customary ways of life, including ancestral agricultural practices. Additionally, consumers in many parts of the world are increasingly conscious about what their food is made from, where it comes from, and under what conditions its components are cultivated. Put simply, now more than ever there is a need to feed more people with more refined tastes using land that is increasingly scarce. Compounding the situation is the fact that intense disagreement exists over how to do so. The ability of different actors to access and use different types of plants forms a crucial part of this debate.

While the nature of modern agriculture has become more complex, the ways that people think about intellectual property for plants have become increasingly narrow. It is now less likely than ever that innovative solutions for the regulation of plants as intellectual property will be developed at the national level. This is partially due to the spread of formal legal obligations that are embodied in the numerous international instruments to which many countries have adhered. However, another explanation is that one particular model of intellectual property for plants – that is, the system of plant breeders' rights – has become dominant. Together, these formal and informal factors have limited the ways that domestic lawmakers conceive of new laws to regulate plants as intellectual property.

Nevertheless, opportunities for innovation remain available, as this thesis has revealed. The analysis centred on exploring the nature of legal experimentation – what it is and how it may operate – for the making of intellectual property laws for plants. In contrast to prior studies, the thesis presented a hopeful story, one in which it showed that even in areas of the law that are often assumed to be fixed and static, space can

still be found for creativity. The study that the thesis undertook focused specifically on different kinds of laws that structure relationships between people, institutions, and plants, whether or not according to the logic of intellectual property. The exploration was guided by the recognition that a formal legal space exists in which lawmakers are able to innovate with locally appropriate solutions with when creating systems of intellectual property for plants.

The thesis grounded its investigation of the limitations and possibilities of lawmaking in the experience of one country, namely Ecuador. The doctrinal and socio-legal research conducted in Ecuador was motivated by a desire to recount how Ecuadorian lawmakers responded to the need to balance international obligations with national concerns during the making of a revised domestic intellectual property framework for plants. Furthermore, the case study explored how officials encountered innovative solutions to the regulation of interactions between people, institutions, and plants in a series of new, alternative legal regimes.

Notwithstanding the existence of a formal legal space, in both Ecuador and other countries particular ways of thinking have shaped – and to a certain extent have limited – local experimentation in the design of novel intellectual property laws for plants. The logic of plant breeders' rights, which is a form of intellectual property that was first formalised in the UPOV Convention and has since spread to countries throughout the world on the wings of bilateral and multilateral trade agreements, has proven especially influential. The plant breeders' rights model prioritises and promotes a particular form of agriculture, and more broadly a limited perspective on how different social actors relate to plants. By narrowly focusing on how to design systems to grant plant breeders' rights – whether based on a perceived need to comply with international treaty obligations, a desire to serve certain local interests, or other reasons – lawmakers may obscure or neglect other important policy goals. As a result, alternative ways of thinking about how people, institutions, and plants interrelate may be marginalised.

Notwithstanding the recognition of the extent to which the plant breeders' rights template has shaped imaginaries for lawmaking, the rationality that this model embodies is not necessarily exclusive of other ways of conceiving of systems to regulate the usage of different types of plants. While prior academic analyses and civil society campaigns have pitted plant breeders' rights against customary approaches

to the management of seeds and other planting material – creating the illusion of diametric opposition – the Ecuadorian experience demonstrated that multiple different agricultural systems and ways of thinking about the plants used therein can coexist in the same place. However, the case study also illustrated that a variety of tensions characterise this space, and for this reason it is important that legal scholars, government officials, and civil society actors alike remain well informed about the limitations and possibilities for the making of inventive intellectual property laws for plants.

Thus, diverse social actors should educate themselves about the nature of the formal legal space that is available for innovative lawmaking in countries that are legally bound to the various international obligations discussed in Chapter 1 of the thesis. As described in that chapter, although the TRIPS Agreement and the UPOV Convention contain certain limitations on the form that national intellectual property laws for plants may take, numerous possibilities for experimentation remain available. Furthermore, it is crucial to recognise that for many countries, legal boundedness does not begin and end in the domain of intellectual property.

Instead, the question for a majority of the national governments in the world is how to reconcile the logic of plant breeders' rights with other ways of thinking about the interplay of people, institutions, and plants. In this context, types of plants beyond those developed by professional plant breeders have attained newfound legal recognition. Evidence for this trend may be found in the increasing popularity of instruments such as the Convention on Biological Diversity, the Nagoya Protocol, the Plant Treaty, and their domestic analogues.

In practice, an assortment of solutions may be identified to reconcile overlapping or competing international obligations and simultaneously address local policy goals. Chapter 2 of the thesis explored a series of standardised approaches that governments could consider for the making of laws that delineate permissible activities related to different types of plants. At the end of the thesis, Chapter 5 presented the variegated strategy that has recently taken shape in Ecuador. The analysis conducted in these chapters demonstrated that some countries – including those which are legally unbound or nations that are legally bound only to the TRIPS Agreement – could develop local, *sui generis* intellectual property laws for plants that need not follow the plant breeders' rights model. Meanwhile, for countries that are

legally bound to the UPOV Convention, it would be possible to create a national system to grant plant breeders' rights while also regulating the usage of various kinds of plants according to alternative principles in different types of legal regimes.

Another conclusion that the thesis derived is that international obligations do not provide the sole explanation for why the plant breeders' rights paradigm has proliferated in recent decades in so many parts of the world. Instead, actors from different societal domains in many countries have internalised a rationality that professes the need to incentivise innovation, support commercialisation, and ultimately reward investments made to develop new varieties of plants. The broad adoption of this paradigm likely provides an explanation for why lawmakers in some countries have chosen to adopt the UPOV Convention model of intellectual property for plants, even where they were under no formal obligation to do so.

The operation of the logic of plant breeders' rights was visible in the making of the *Ingenios* Act of Ecuador, as described in Chapters 3 and 4 of the thesis. Although this law was conceived in a political environment that claimed to offer an alternative to conventional approaches to economic development, in reality the *Ingenios* Act never intended to radically re-invent intellectual property for plants. Instead, the new regime was designed to operate as a tool to transform the national economy.

One senior official at the National Secretariat for Higher Education, Science, Technology and Innovation told me unequivocally that the *Ingenios* Act was designed based on the recognition that "agroecology can provide much added value to the economy."[815] Plant breeders' rights were thus understood to represent a means by which the country might "incentivise innovation,"[816] towards the creation of a knowledge-based economy. Therefore, even in the absence of the formal legal obligations to which Ecuador is subject, it is unlikely that government actors would have radically departed from the plant breeders' rights model when designing the reformed system of intellectual property for plants. In the words of another high-ranking official with whom I spoke, the new Ecuadorian framework for the regulation of plants as intellectual property should be understood as "disruptive, but not rupturist."[817]

[815] Director level official at the National Secretariat for Higher Education, Science, Technology and Innovation. (15 June 2016). Personal interview.
[816] *Id*.
[817] Director level official at the Yachay Public Enterprise. (1 April 2016). Personal interview.

Nevertheless, it is noteworthy that the recent history of Ecuadorian lawmaking has involved a kind of playfulness or experimentation with the limitations and possibilities for innovative solutions to the question of how to structure relationships between people, institutions, and plants. The new legislative frameworks that have resulted are not perfect, but the general process is laudable for its willingness to question conventional norms, open spaces for direct citizen participation, and create customised approaches to address local issues. Although Ecuador is a country endowed with certain advantages that facilitated the rapid pace of reform – for instance, the dominance of a single political party in government; a recent history of civil society activism; the election of indigenous leaders to leadership positions in the government – there is no reason to believe that its approach to lawmaking could not be adopted in other places.

For some countries, the opportunities for experimentation with inventive forms of intellectual property for plants that would deviate from the rationality of plant breeders' rights are limited. However, this is not to say that all hope for change is lost. To the contrary, and as demonstrated through the case study of Ecuador, an assortment of possibilities remains available to lawmakers with the audacity to innovate. Some of these alternatives were presented in Chapters 2 and 5, though claiming that one model is universally preferable would be antithetical to the fundamental argument of the thesis. While the experience of Ecuador may be informative, it is hoped that lawmakers who in the future are tasked with the regulation of plants as intellectual property will turn inward, imbuing the legislation that they create with rationalities that resonate most strongly with their constituents.

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Appendix A: Copy of the Ethics Approval Letter for Human Subjects Research

David Jefferson - Ethics Clearance - PhD

Graeme Orr <g.orr@law.uq.edu.au>

Mon 19/11/2018 10:16 AM

To:David James Jefferson <david.jefferson@uq.net.au>;

1 attachments (6 MB)

Applicaiton Form for Ethical Clearance for Research Involving Human Participants - David Jefferson.pdf;

Dear David

This email is to notate that your ethics application to interview professionals about Ecuadorean intellectual property law was received by the Law School RHD Administrator and forwarded to the Law School Research Ethics Committee on 22 February 2006.
A copy of that application is attached.

After discussion, in February 2016 **the application was consequently approved as 'low risk'**, under the relevant NHMRC/UQ guidelines, by Professor Heather Douglas and myself on behalf of the Committee.

Yours sincerely

Graeme Orr

Professor, Law School
Law RhD Director 2015-2017
Chair, Law School Research Ethics Committee 2010-2016